Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Waves
PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY
MONADNOCK BLOCK, CHICAGO

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Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1897

Volume 67
Number 26

CHICAGO, SATURDAY, DECEMBER 26, 1914

Subscription—10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

NO TIME TO LEARN.

This thing of "no time to learn" is a queer proposition. It is always the man with the least amount of spare time who partakes most plentifully of the tree of knowledge. The other fellow uses up all of his time in lamenting the lack of time and opportunity.—Everett R. Roeder.

The Essentials of Running a Telephone Business.

"Recently I have been somewhat surprised to note the change in the popular topics of conversation," said H. F. Thurber, vice-president of the Chesapeake & Potomac Telephone Co., in an address to telephone men. "In these days, when I find a group of telephone men assembled, they still talk telephone—in fact, it is doubtful whether any telephone man can talk anything else—but the subjects seem no longer to be about how to run a telephone business. The prevailing topics of conversation seem to be about commission decisions and pending rate cases, the possibility of government ownership, methods of preparing inventories, or disquisitions on the theory of depreciation, or the Interstate Commerce Commission's methods of expense analysis.

"Now all of these subjects are of great importance; many of them are of critical importance, but I wish to point out that they are not the vital, constructive elements of furnishing service. They relate, rather, to demonstrating to others how a telephone business is run, than to the essentials of running it."

The points as to topics of conversation which Mr. Thurber brings out, are true of Independent telephone men as well as of Bell men. The essentials of running a telephone business are neglected to a great extent in discussions when telephone men meet. They are interested in them, of course, but the other topics seem more attractive to them just now. It appears that there are really two divisions being made in the business. In one division may be placed plant or operating men, that is, the men who are interested in the various branches having to do with the provision for and the furnishing of service. In the other division may be placed those who are not engaged in the technical or producing side; that is, the presidents, officers, managers and other executives who look after the financial and public affairs.

Both of these classes of telephone men are deeply interested, however, in the fundamental principles that apply to the branches of the business in which they are engaged. The president is not interested in knowing why a certain circuit will work, but he is interested in the economic principles underlying the regulations of rates. The man who has been in the company's employ only a few months is not interested in the question of when it is more economical to place cable underground than overhead; the manager may be greatly interested in that particular point, but the new man wants to know how the telephone works, what the underlying principles of its operation are.

So Telephony has decided to undertake the publishing of two reading or home study courses. They will be conducted along unique lines and will in no sense be correspondence courses. Quiz questions will follow each installment but reference will be given as to the particular section of the reading matter in which the answer may be found. From time to time, problems designed to illustrate the application of principles, will appear. Those so inclined, may work out solutions in order to compare with a model solution which will be published after a short interval. Each installment will be full of interest, not only to the new man in the business, but to the older men also, as the subject matter will be presented in a manner such as to hold the interest of every reader.

The first course will start early in January and will be devoted to "the essentials of running a telephone business" as Mr. Thurber puts it. The elements of telephony will first be taken up, after which will come electricity and magnetism in their relation to telephone work. Lines and line construction will be dealt with, as will be the various types of exchanges and equipments. Testing and maintenance, traffic, specifications, materials, and, in fact, every subject relating to branches in which men engaged in producing

telephone service are interested, will have a place in the course. An operating man may not be interested in the elements of telephony, but he is certain to find, somewhere in the course, matter which will aid him in being a better telephone man.

After this course has been launched, another course will be started which will interest, primarily, the men engaged in the executive side of the business. This course will deal first of all with the subject of economics and point out the various principles which relate to the telephone industry. The principles of costs, rates, regulations, etc., will be set forth and their applications explained. Engineering economics will deal with the application from an engineering point of view, of economic principles.

An interesting section of this course will be that devoted to organization and management. Included in this part will be discussions as to the advantages of incorporation, the issuance of securities, the corporate organization and the operating organization. Closely allied to management is the subject of accounting and this will be treated, not from the point of view of the bookkeeper, but from that of an accountant. In other words, the principles will be set forth in such a manner that the manager may be able to apply them to his own books to see if they are properly and intelligently kept.

Just now the subject of valuation and all that it involves, is of paramount importance, in the minds of many telephone executives. It will have a prominent place in the course, as will the subject of public relations which is becoming of greater importance each year.

The scope of these two courses is so broad that it will take a long time to cover the ground in the manner in which it is planned. Therefore, only a general outline can be given at this time, as it will undoubtedly be necessary to make changes in details from time to time. Telephone men, qualified by years of training and practical experience, will write the various sections. The subjects will be treated from a strictly impartial point of view in order to present all the actual facts and principles involved.

The presentation of these courses marks the beginning of a new era in TELEPHONY'S history—an era which will be devoted to the upbuilding of the telephone industry as a whole. The conservation of telephone investments is now of paramount importance. This can best be done through a thorough understanding, by the men engaged in the work, of all the essentials of operation and management. Good service is imperative; but economy of operation with an efficient staff of employes is required, in order to obtain a fair return on the investment. These are the aims of TELEPHONY in the introduction of the reading or home study courses.

Come Down to Earth

By HERBERT KAUFMAN

When you make your calculations, be sure that you're not estimating by air line. Survey the ground before you invest your time and your money. Half the wrecks of enterprise can be traced to the miscalculations of theory.

An aeroplane can follow the shortest route because it encounters nothing but atmosphere on the way; but a railroad train must deal with rivers and mountains, grades and swamps. The best of engineers is challenged by physical conditions, none of which are encountered overhead.

Pessimists are ex-optimists, who didn't investigate before they invested. The most prolific sources of opportunity are the junk-piles of misguided endeavor. The majority of things which "didn't go through" were perfectly feasible, but rashly maneuvered. Many a millionaire owes his fortune to the same undertaking which is responsible for another man's bankruptcy.

Management is the rarest of gifts. The ability to guide oneself and one's affairs along the lines of least resistance—to escape unnecessary waste and to avoid escapable hazards—these qualities stamp the true leader. You don't have to bother with new notions while so many excellent projects are calling for reclamation and efficient regulation.

In whatever direction we turn, there are convenient little books which explain "how to do it"; and myriads of zealous and ambitious young-men-in-a-hurry devour the inexact and often impractical declarations of authors who assume authority without having undergone the requisite experience to qualify them for their roles.

As old Cyrus Simmons used to say: "I don't know how much, but I know it thoroughly. My general experience is limited, but I can teach school in my own shops. I don't put my mind on more matters than I can put my fingers on.

"Considering how many folks there are trying to get along in this world, it's a good sized life job to pick out a specialty and master its details.

"I've met lots of individuals who could take a map and construct a transcontinental line with a pencil and a ruler and a listener. The only thing that upsets their calculations is execution. If I could harness one per cent. of the enthusiasm of fools, I'd rebuilt the universe in a year.

"Come down to earth, it's the only place where you can find a solid foundation. If you start higher than bedrock, you'll end there, anyhow."

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Plans for Minneapolis Meeting of American Association

Program and Arrangements for Second Annual Convention of Independent Telephone Association of America to be Held in Minneapolis, January 19, 20 and 21 Well Under Way—Special Train from Chicago—Operating Rules Issued by Association

Preparations for the second annual convention of the Independent Telephone Association of America, to be held at Minneapolis, January 19, 20 and 21, are well under way. According to association officials, the program and the exhibits bid fair to eclipse those of any previous convention. The sessions of the convention will be held at Hotel Radisson, which is located on Seventh street, just off of Nicollet avenue.

The program will cover the discussion of problems which are of great importance at the present time. The topics which will be presented for discussion will include such subjects as "A qualified toll line contract that would be fair and equitable," "Accounting," "Transmission," "Operating," "Switching rates," etc. These subjects will be presented by men whose experience and investigations qualify them to speak in an authoritative manner. The stereopticon, which was a feature of the convention last year, will be again used to present a mixture of "sense and nonsense."

Notwithstanding the fact that the convention dates are nearly a month away, Secretary W. S. Vivian reports that more space has been reserved than for many conventions. It is expected that within the next two weeks every available room in the hotel will be taken. The exhibits will show all kinds of standard and modern apparatus and appliances, as the manufacturers and supply dealers are heartily cooperating with the association officers.

Hotel Radisson, Minneapolis.

This is the first time in several years that a national telephone association has held a convention in any other city than Chicago. The holding of this convention in Minneapolis will be somewhat in the nature of a test. The reasons which led the association officials to decide upon holding the convention in some other city than Chicago were:

First. It will give hundreds of Independent telephone companies operating within a radius of two or three hundred miles of Minneapolis, an opportunity to attend a national Independent telephone convention for the first time. By moving from city to city each year, ultimately every small company in the United States will have had an opportunity to attend a national convention.

Second. In the city of Chicago, the association has never been able to get a proper or fair amount of newspaper publicity. By going to different sections of the country, it is expected that the newspapers will give the event a great deal more space, and further, give the association an opportunity to mold public sentiment favorably to Independent telephony. An experienced newspaper man has been engaged to prepare articles for publication.

Third. It will enable the association to be of some assistance to the Independent company operating in the city where the convention is held, by showing that community that the Independent telephone business extends throughout the length and breadth of the land, and is not simply a local proposition.

Fourth. The association expects to get many new companies as members by means of this policy.

All of these reasons, the association officials believe, should meet with the approval of Independent telephone men. Some may object to going away from Chicago because of the additional expense to those living in the Eastern and Southern sections of the country; still this additional expense will only be a very small part of the convention expense, as Minneapolis is only a night's ride from Chicago, and the fare, including sleeper, is only $10.05.

For the convenience of those who will go to Minneapolis by way of Chicago, arrangements have been made with the Burlington Railroad for a special train which will leave Chicago, Monday evening, January 18, at 6:30 p. m. By this means the various persons in the party will have a good time in addition to an opportunity to become well acquainted. The train will be modern and complete in every way. Tickets may be purchased from local station agents at the regular rates, routed by way of Chicago and the Burlington route from there to Minneapolis. It is urged that reservations be made now for the special train from Chicago. As there are other conventions to be held in Minneapolis the same week, reservations for rooms at Hotel Radisson should be made now, as difficulty may be experienced if delayed until the convention. Secretary Vivian will be glad to make reservations for anyone planning to attend the convention, either for the special train or at Hotel Radisson, or to render any other assistance that may be desired.

Minneapolis and St. Paul, commonly known as the Twin Cities, is the home of the Tri-State Telephone & Telegraph Co., one of the largest and most progressive Independent companies in the United States. This convention will afford an opportunity to men located in other parts of the country, of going through a number of its exchanges.

A neat, yet striking, invitation has been mailed by the association to its members and prospective members. It gives full information relative to the special train and reg-

ular train service on the Burlington between Chicago and Minneapolis; also data regarding Minneapolis and St. Paul. A neat booklet descriptive of Hotel Radisson and its many attractive features is also included with the invitation.

Recently the Independent Telephone Association of America issued in booklet form "Local Operating Instructions," in which are embodied rules and regulations governing the handling of traffic. Two pamphlets have been issued, one for magneto exchanges and the other for common battery exchanges. For something like six months, Secretary Vivian was engaged in holding conferences with managers and chief operators in order to formulate these rules. After preliminary drafts had been drawn up, the rules were submitted to companies in various parts of the country for criticism. All of the criticisms were carefully considered and the rules changed so as to be as near complete as was possible to make them. Since the pamphlets have been issued, no complaints have been received relative to them, but a great many complimentary letters have come to the association offices. The rules are put up in the same form and style as the "Rules for long distance operating." They are furnished to members of the association at 25 cents a copy and to non-members at 50 cents.

Government Ownership of Telephones.

The annual report of Postmaster-General Burleson, in which he recommends government ownership of telephone and telegraph systems, has again resulted in discussion of this issue, but so far as can be determined, there is much less interest in the question than there was after his report, with somewhat similar recommendations, last year. This would indicate that no developments will come in the near future in the direction of federal acquisition of wire plants, and some Eastern telephone interests go so far as to say that the agitation is ended for some time to come, at least.

Not only is waning public interest indicative of the collapse of the issue, but as particularly significant, it is pointed out, is the absence of support of the issue apparent at Washington. A large percentage of the members of Congress are known to be flatly against any such bill at this time, and even those who are inclined to favor government ownership are lukewarm.

It is believed that among the government officials against the acquisition of telephone and telegraph lines by the government is numbered President Wilson himself. In view of that fact, some surprise was expressed that one of his cabinet officers would propose the matter in opposition to his views. Government ownership of lines, including the Bell and Independent companies, would involve an immense cost of something like two billion dollars, an authority has said, adding descriptively that that would be the price at which the plants could be "seized" by the government. At any rate, he declared, the government would go slow about doubling the national debt.

The real motive behind the frequent advocacy of government ownership of telephone and telegraph lines, according to an opinion recently expressed, is the desire on the part of government heads to obtain more power. Naturally, a large increase in the number of employes would mean a substantial growth in importance of a governmental department and to the head of the department it would bring increased power in the way of patronage and scope of operation. It is pointed out that the taking over of the Bell companies, alone, would mean the extension of the post office department's personnel by about 150,000.

In an address before the Telephone Society of New York, N. C. Kingsbury, vice-president of the American Telephone & Telegraph Co., who represented the telephone company in the negotiations with the then United States Attorney General J. C. McReynolds, which resulted in the voluntary separation of the Western Union Telegraph Co. and the American Telephone & Telegraph Co., recently discussed the attitude of the Bell system toward government ownership.

"We have heard a good deal recently in regard to government ownership of the telephone and telegraph," he said. "We do not believe it is our duty as a corporation either to champion that plan or violently to oppose it. When the people of this country decide that it is their wish that the government of the United States will own them—then the government will own them—there is no doubt about that. We do not intend to set ourselves up in opposition to the expressed wish of the people—that is not our plan, nor our policy—but we are going this far: It is our policy to present the salient facts. We do believe it is our duty to let the people know just what is involved in the proposition of government ownership.

"There are no secrets in our business. The annual reports of Mr. Vail have kept nothing back. Investigation could reveal nothing beyond what he has voluntarily published. He has sought to let the public know just what our business means when viewed as a whole; what purposes it seeks to realize; and what prospects for adding to human comfort, convenience and happiness it holds out."

A. T. & T. Earnings Improving.

It is reported that the betterment in the American Telephone & Telegraph Co.'s earnings which started November 1 has been continued and each succeeding week has shown a slight advance. The first week in November the gross receipts were a fraction over 100 per cent. of what they were for the same week of 1913. In September and October traffic was making comparative decreases and at one time got down to 95 per cent. of normal.

For the first two weeks in December traffic was 102 per cent. of what it was for the corresponding week of 1913. While not a big advance, it is an encouraging one, and for a corporation whose weekly gross income is substantially over $4,000,000, it is most important in the matter of dollars and cents.

Strictly speaking, this 102 per cent. of last year's business is not "normal." A proper gain in gross would be 6 to 8 per cent. At the same time it is well to bear in mind that the first six or seven months of 1914, before the European war burst, were not a period of satisfactory telephone growth. The expansion in this period was only a little over 5 per cent., against 8 per cent. in 1913. Poor business conditions were clearly slowing down the gain in the Bell system's receipts. The war, on present showings, has slightly more than cut in two the gain of the earlier months.

The present outlook, it is said, is that the American Telephone & Telegraph Co. and its operating companies will conclude the fiscal year on December 31 with an addition to gross of between $6,000,000 and $8,000,000 of new business, bringing total gross up to about $223,000,000, against $215,572,000 for last year.

Perfection of German Field Telephone Service.

E. Alexander Powell, special correspondent of the New York World, who spent a day with the ninth German army, noticed the "magnificent" telephone system of the kaiser's generals, making special mention of it in his reports to London. The correspondent said the field telephonic service was such that the commanding general could converse with any part of his 50-mile long column, a corp of bicycle soldiers being engaged stringing coils of insulated wire from tree to tree along the route.

"So perfect was the field telephone service," continued the correspondent, "that the staff had been able to keep in touch with our progress along the lines, and were waiting dinner for us." Mr. Powell had motored many miles to interview General von Boehn and to dine with him.

Annual Convention of South Dakota Association

Twelfth Annual Meeting of South Dakota Independent Telephone Association Held at Sioux Falls Last Week Signalized by Presence of Members of South Dakota Railroad Commission—Government Ownership, Public Regulation and Accounting Principal Topics Discussed

The twelfth annual convention of the South Dakota Independent Telephone Association was held at Hotel Carpenter, Sioux Falls, S. D., December 16 and 17, there being about 60 telephone men from all parts of the state in attendance. A feature of the two-day meeting was the presence of members of South Dakota Railroad Commission.

First Day's Session.

The visitors were welcomed in behalf of the Sioux Falls Commercial Club, by L. M. Gibbs, secretary of the club, and President J. A. Steninger responded.

President Steninger in his opening address to the telephone men and members of the board of railway commissioners, said in part:

"This is our twelfth convention and our association is one among the first organized. I feel that it has been of great help to me and that I never attend a convention but what I get new ideas and inspiration, and go home determined to become more efficient in the telephone business, and no doubt others feel much the same.

Next, in my mind, to the benefits to be derived from the association is from our railroad commissioners in the way of physical connections, lucrative rates and adjustments between telephone companies. I believe they are the friends of all who try to do right, notwithstanding that some of the farmer companies seem to doubt their jurisdiction over them."

Public Ownership of Telephones Discussed.

The question of public ownership of telephones was the chief topic of discussion at the afternoon session following an address on the subject by Guy H. Pratt of Omaha, general commercial superintendent of the Northwestern Telephone Co. Mr. Pratt said, in part:

"The advocates of government ownership have held out the promise of increased efficiency, continued expansion of service, lower rates and a complete economic advantage to the nation by public ownership and operation. It is often claimed that private ownership cannot serve the public in that broad sense—'the greatest good to the greatest number'—because of the motive of private gain. We stand on our record. We have given the cheapest telephone service in the world, and we have extended the service more generally than any government-owned system on earth.

There is no argument in favor of government ownership, from the standpoint of the telephone user, unless the government will furnish better or more extensive service at the same rates, or the same service at lower rates, than private organizations.

From an employe's viewpoint there is no reason for favoring government ownership unless it will give the employe higher wages or better working conditions than he is now enjoying under private operation."

Telephone Rates Here and in Europe.

"The United States has the lowest priced telephone service in the world. If we had a government ownership advocate here, he would probably say the average price paid in the United States, per telephone, is around $30 per year, and in Germany about $22 a year.

The $22 charge in Germany, against $30 here, sounds as if it is cheaper service, but the fundamental of prices is the buying power of a dollar. What can be bought for a dollar in Germany compared with what one can buy for a dollar in the United States? You can buy one and one-half for one.

Wages paid telephone operators in foreign countries as compared to the average wages paid in the United States, are: Austrian, 33 per cent.; France, 45 per cent.; German Empire 46 per cent.; Great Britain, 55 per cent.; and Sweden, 40 per cent.

The actual prices paid for service per telephone per year in five leading European countries having government ownership are:

Austria	$24.96
Belgium	39.05
France	28.67
Germany	22.69
England	32.60

The average is $29.58 against an average of $30.45 charged by the Bell system in America; but, remember, in Austria $1 will buy what requires $2 in the United States in payment of wages and the purchase of necessities; in Belgium, the ratio of prices as compared with the United States is about $1 to $2.32; in France, $1 to $1.48; in Germany, $1 to $1.50; and in England, $1 to $2.28.

Private companies own and operate a very large part of the telephones in Denmark, Norway and Sweden. In all other countries in Europe, the governments operate practically all of the telephone service. In each of the three countries where private companies operate the majority of the telephones, there are more telephones per population than in any country where the government operates, and the service is the best on the continent. Twenty-four hour telephone service, as we understand it, is almost unknown in Europe.

The kind of long distance service generally furnished by European countries would never be tolerated by Americans.

There are two classes of long distance telephone service in Europe—'urgent' and 'ordinary' messages. 'Urgent' calls are made at higher rates and have precedence over 'ordinary' messages. In America there is no such distinction, but the average time it takes to put through a long distance call for like distances in America is quicker than the time of 'urgent' calls in Europe.

In America we have a telephone for every 10 persons; Europe, with most of her systems government owned, has only one telephone for every 150 people. Think of it! America with 6 per cent. of the world's population has 64 per cent. of the world's telephones.

Today, Chicago, under private ownership, has more telephones than all of France; Minneapolis and St. Paul more than all of Italy; Omaha more than all of Spain, and Des Moines more than all of Portugal, Greece, Servia and Bulgaria combined.

Wherever government ownership has been tried the rates are higher, the service poorer, and the number of telephones per capita lower, than under private ownership in America."

Canada Tries Government Ownership.

"What success has Canada had with government ownership? Here is the record of six years past:

January, 1908. Government purchased Bell telephone property in Manitoba.

March, 1908. Rates for certain classes of service increased 25 per cent.

March, 1910. Chairman of the telephone commission declared the rural rates inadequate.

May, 1911. Many long distance rates doubled and time limit generally decreased from three to two minutes.

November, 1911. Chairman of telephone commission reported a loss for the year, of $150,000, without making any provision for depreciation.

December, 1911. Announcement of increase in rates aroused a storm of protest.

June, 1912. Public distrust of the telephone commission and suspicions of graft forced the appointment of a royal commission, which condemned the proposed increase on the ground that 'the system has generally been administered extravagantly and that a very large saving could be made by economical management.' Telephone commission resigned.

July, 1912. Increase of 20 per cent. in rates for business and residences were announced, establishing a higher schedule than that of the Bell company before purchase by the government."

REGULATION—THE PEOPLE'S SAFEGUARD.

"Regulation is a subject that is always in dispute, but it is the answer to public ownership. It will protect the rights of the people in an efficient way, as they never can be guarded by public ownership and operation.

Regulation can effectively curb monopoly and selfish exploitation and make them be a genuine benefit to the public rather than destroy them. Regulation conserves and protects the interests of the whole public while retaining the private initiative that has prompted invention, enterprise and progressiveness, placing America the foremost industrial nation in the world."

In the evening, Judge C. B. Kennedy spoke on "Compensation of Telephone Companies," and J. H. Shoemaker, of Minneapolis, spoke on the topic, "Our Side of Justice." He declared that it was proper that the public should be protected against exorbitant charges by the telephone companies, but that it was also justice that the telephone companies should be protected against unreasonable demands for reduction of rates.

THE SECOND DAY'S SESSION.

At the morning session of the second day of the meeting, P. W. Dougherty, counsel for the South Dakota Railroad Commission, delivered an address on "Public Regulation of the Telephone Business."

Mr. Dougherty reviewed the events leading up to state inspection of public utilities. He pointed out that while the state board seeks to restrain telephone companies and railroads from putting into effect unjust rates, it also protects the companies from unreasonable demands made upon them, seeking to have them operate at the lowest rate at which they can give the public good service and make a reasonable profit upon the property invested.

T. E. Cassill, secretary of the state commission, gave an address in the afternoon on "Uniform System of Accounting for Small Companies." He urged that the method should be such as to show the owners of the company what every department was costing them and what profit, if any, they were making on the various classes of service. His address, in part, was as follows:

"For practical purposes there are a great many reasons for proper accounting. I would think that the satisfaction of knowing that the exact condition of the business from day to day and from month to month would in itself repay the efforts of the companies interested, many times over. A great many of the laws passed by the legislature of this and other states are in the interests of shareholders, bondholders and mortgagees, and for the benefit of these parties, there should be supervision of accounts in order that the proper attention be given to the depreciation fund and to other matters so as to insure that the capital is not impaired to make up dividends. Another one of the principal reasons for keeping such accounts is to enable a company to furnish the necessary information in the event of the filing of an application for increase in rates in order to obtain sufficient revenues for the maintenance and depreciation of the plant and for dividends on capital invested.

The right to increase rates will depend largely upon the showing that the present rates do not produce a fair return. The work connected with preparing the reports to the board of railroad commissioners and the tax commission, as well as reports to directors and stockholders of the company, will be greatly simplified if the proper accounts are kept.

In issuing a system of accounts to be kept by the smaller companies the board of railroad commissioners of this state should conform as nearly as possible to the system issued by the Interstate Commerce Commission. This should be done in order to do away with a dual set of books for companies that may be compelled to report to the Interstate Commerce Commission as well as to the state commission.

Upon first thought a great many of the telephone men will no doubt think that there is no use for so many accounts and that because there are so many, it complicates matters. But when one gets an understanding of the system and considers that there are but a few accounts that might be termed active, I think he will realize the necessity of keeping all the accounts and be anxious to get at it as soon as possible. Each account is numbered and the numbers so arranged that in the event any company desires to expand by keeping additional accounts, they may be readily inserted in the proper places."

The officers for the ensuing year are: President, J. A. Steninger; vice-president, H. P. Hartwell; secretary-treasurer, A. S. Hall. The members of the executive committee are: J. A. Steninger, B. M. Ryan, A. S. Hall, J. Wilson, E. C. Kart, C. B. Miller and R. E. Cameron.

The annual banquet was held at 6 o'clock on Thursday evening at the Carpenter Hotel. J. A. Steninger, president of the association, presided as toastmaster, and short talks were made by many of the telephone men. Following the banquet, the members of the association, as the guests of the commercial club, were entertained at a theatre party, which was the closing feature of the convention.

Annual Report of Dallas (Tex.) Automatic Telephone Co.

The Dallas Automatic Telephone Co., of Dallas, Texas, has issued the following report to its stockholders for the fiscal year ending July 31, 1914:

INCOME.		
Exchange service rentals	$ 255,915.72	
Toll service rentals	3,832.66	
Miscellaneous operating income	4,951.13	
Gross operating income		$ 264,699.51
EXPENSES.		
Operating expense	$ 47,189.81	
Commercial expense	21,301.12	
Maintenance expense	22,433.67	
General expense	25,127.45	
Taxes	35,073.47	
Interest	3,579.18	
Total expenses		$ 154,704.70
Net operating income		$ 109,994.81
Bond interest		43,202.50
		$ 66,792.31
Depreciation	$ 16,206.23	
Suspended debtors	5,000.00	
		21,206.23
Net income carried to surplus account		$ 45,586.08

ASSETS.

Investment assets:		
Real estate and buildings	$ 138,791.68	
Plant and equipment	1,733,719.52	
		$1,872,511.20
Working assets and accrued income:		
Cash and deposits	$ 13,705.65	
Accounts receivable	36,105.66	
Bills receivable	1,708.50	
Company's bonds in treasury	250,000.00	
		$ 301,519.81
Deferred charges—prepayments:		
Prepaid insurance	$ 1,301.85	
Prepaid directory	2,339.82	
Prepaid interest	4,598.42	
Other prepayments	2,005.90	
		$ 10,245.99
		$2,184,277.00

LIABILITIES.

Capital stock authorized and issued:		
First preferred 8% cumulative stock (9,950 shares of $100.00 each)	$ 995,000.00	
Common stock (50 shares of $100.00 each)	5,000.00	
		$1,000,000.00
Bonded Indebtedness:		
First mortgage 6% gold sinking fund bonds	$1,000,000.00	
Redeemd by trustee of sinking fund and canceled	41,000.00	
		$ 959,000.00
Working liabilities and accrued liabilities:		
Accounts payable	$ 19,402.17	
Bills payable	100,503.75	
Accrued interest on bonds and bills payable	3,739.50	
Accrued taxes	14,673.04	
Unclaimed dividends	6.00	
		$ 138,324.46
Reserves:		
Depreciation	$ 36,271.82	
		$ 36,271.82
Surplus:		
Before charging dividends on the cumulative preferred stock	$ 90,480.72	
Dividend paid January, 1914	$19,900.00	
Dividend paid July, 1914.	19,900.00	39,800.00
		$ 50,680.72
		$2,184,277.00

The Dallas Automatic Telephone Co. began operating its system in April, 1912. No charge, however, was made for service until it had connected and in operation within the city of Dallas 5,000 telephones. This condition was attained in July, 1912, and commencing August 1, 1912, its rates became effective. Thus the statement for the fiscal year ending July 31, 1914, covers the second year of the company's operating existence.

The company's original plan contemplated the installation of 8,000 lines, but it was soon seen that such an installation would be inadequate. Therefore, provisions were made for the initial installation of 10,000 lines with an ultimate capacity of 35,000. The construction of the plant was not fully completed until January 31, 1913, so this statement covers the first year after the full completion of the plant.

The plant has had, and is continuing to have, a substantial and steady growth. Each month has seen a marked increase in the number of its patrons.

The officers and directors of the company are as follows: J. C. Casler, president; Clarence E. Linz, vice-president and secretary; J. S. Kendall, treasurer; H. D. Ardrey, J. S. Kendall, Harry L. Seay, C. F. Freeman, J. C. Casler, Frank E. Austin, Elihu A. Sanger, Rhodes S. Baker, Clarence E. Linz, and J. Fred Schoellkoff, directors.

Advance Payment Case in Nevada.

Complaint has been filed against the Bell Telephone Co. of Nevada, in the district court of Washote County, Nev., by J. S. Parker of Reno, for $405 damages, on account of the failure of the telephone company to install an instrument in his office on or about the first of last June. The statute under which this suit is brought was passed by the legislature of 1913, and is embodied in chapter 274, statutes of Nevada. The statute provides that upon the written application of the owner or occupant of any building within 200 feet of the company's line, the company must install telephones without requiring deposits or payment in advance. The company may require the applicant to execute a bond in the sum of $5, with one freeholder as surety. If the company neglects to install such instrument for 30 days, the statute provides a penalty of $50 as liquidated damages, and $5 additional liquidated damages for each day thereafter that the company shall neglect to install the telephone.

The plaintiff's complaint alleges that he first requested the company to install the telephone about June 1; that he was required to sign a contract and deposit $5 as a condition precedent to the installation of the instrument; that he refused to make such deposit and that the company failed to make such installation until September, when he called its attention to the statute.

The Railroad Commission of Nevada, which has jurisdiction over telephone companies, issued an order February 21, 1914, prohibiting the telephone companies from demanding a deposit before the installation of instruments, but allowing them to exact two months' payment in advance, and at the expiration of the two months, companies are permitted to demand one month's rental in advance.

Correct Use of Telephone in Reporting Fire.

The fire chief of Indianapolis, Ind., has appealed to the telephone companies of that city to assist in educating the public to the correct use of the telephone in turning in fire alarms. Within the last few months, several unnecessary fire losses have been occasioned by failure of the public to understand just how to turn in an alarm.

The fire alarm telegraph is rapidly being discarded, the fire alarms received over the telegraph system being few and far between. In view of this fact, Fire Chief Johnson has appealed to the telephone companies for help. He is asking that they carry instruction in their directories, warning people that there is one and only one number to call, no matter which company is used. The trouble is due to the fact that the fire department has many different telephones connecting with a number of different offices and officials. In the hurry of the excited individual with a fire to report, several numbers may be run over in the mind as the right one to use before one is picked, and then he may not have the right one. This has happened in several cases, so the companies are promising in the next issue of the directory to make it clear which number to use, and emphasize the fact that it is the only one to use.

The Cables Across the Golden Horn, Constantinople

The Problem of Providing Communication in the Business Section of City, Which is Cut in Two by The Golden Horn—Submarine Cable Direct from Shore to Shore Considered Impractical— The Electrician, of London, Describes Plan Finally Adopted

By A. Podmore

The Golden Horn lies between the two largest exchanges, viz., Pera and Stamboul, of the 16 which are being erected by the Société Anonyme Ottomane des Téléphones de Constantinople, under a concession granted by the Imperial Ottoman Government to the Anglo-French-American combine in 1911. It therefore became necessary to lay trunk lines between these two and the other exchanges which are being provided on the other side of the Horn.

A large amount of foot and vehicular traffic (a great proportion of the latter being very heavy) is constantly passing between Stamboul and Pera. To cope with this, there are two pontoon bridges erected, each bridge being constructed with a "partie mobile" to allow the passage of large vessels up and down the Horn. Owing to the number of these vessels taking up anchorage at this place and to the large spread given to the anchor chains for the bridge, the advisability of laying a submarine cable direct from one shore to the other is questionable, if indeed practicable.

It was decided, therefore, to untilize one of the pontoon bridges as much as possible, only laying the cables under water at the "partie mobile," the cables at each side to be attached to the immobile parts of the bridge. A general idea of the construction of this bridge is given in Fig. 1.

Four hundred pairs of conductors are laid between the two extremes. In order to reduce to a minimum the possibility of absolute isolation, even for a short time, of the exchanges on the Stamboul side from those on the Pera side of the Horn, due to accidents, two cables have been laid, each of 200 pairs.

A pontoon bridge is, of course, never stable and there are two elements to take into consideration which might at some time cause considerable trouble if the necessary precautions are not taken. I refer to the movements of the bridge which may be described as—

(*a*) Vibration set up by heavy traffic;

(*b*) Rise and fall of the pontoons caused by the motion of the sea.

Either of these elements would be sufficient, in time, to cause crystallization of the lead sheathing of what is now recognized as standard telephone cable, viz., dry core, lead covered.

The cables laid may be divided into two sections for the convenience of this article: 1. That portion attached to the immobile part of the bridge; 2. The submarine portion under the "partie mobile."

Dealing with section 1 first: To overcome the disturbing elements *a* and *b*, the cables were hung on stranded steel suspenders by means of G.I. rings. These suspenders were again attached to cross suspenders composed of two No. 8 G.I. wires, which were in turn attached to the construction work of the bridge. No. 8 G.I. wires were used for the cross suspender owing to the impossibility of making-off a stranded steel suspender sufficiently taut in the space between the girder and the under side of the bridge.

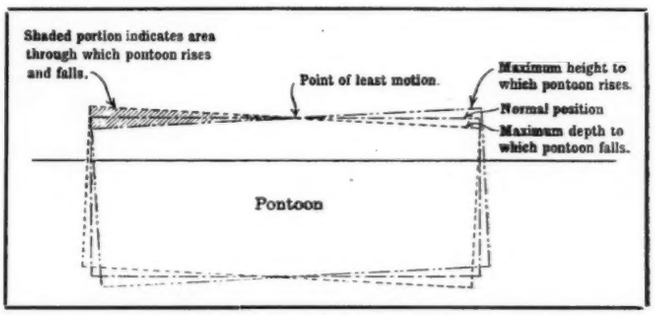

Shaded portion indicates area through which pontoon rises and falls.
Point of least motion.
Maximum height to which pontoon rises.
Normal position
Maximum depth to which pontoon falls.
Pontoon

Fig. 2. The Point of Least Motion on Pontoon.

By this means, it is found that the vibration transmitted to the cable is reduced to a minimum. The rise and fall motion of the adjacent pontoon sections of the bridge is reduced to a negligible quantity, as the distance between the two cross suspenders is 10 meters, between which the rise and fall of the pontoons is taken up by the cables, as compared with a distance of 15 cm., which would be the distance if the cables had been clamped to the girder work of the bridge.

Each of the cables laid on this section contains 200 pairs of

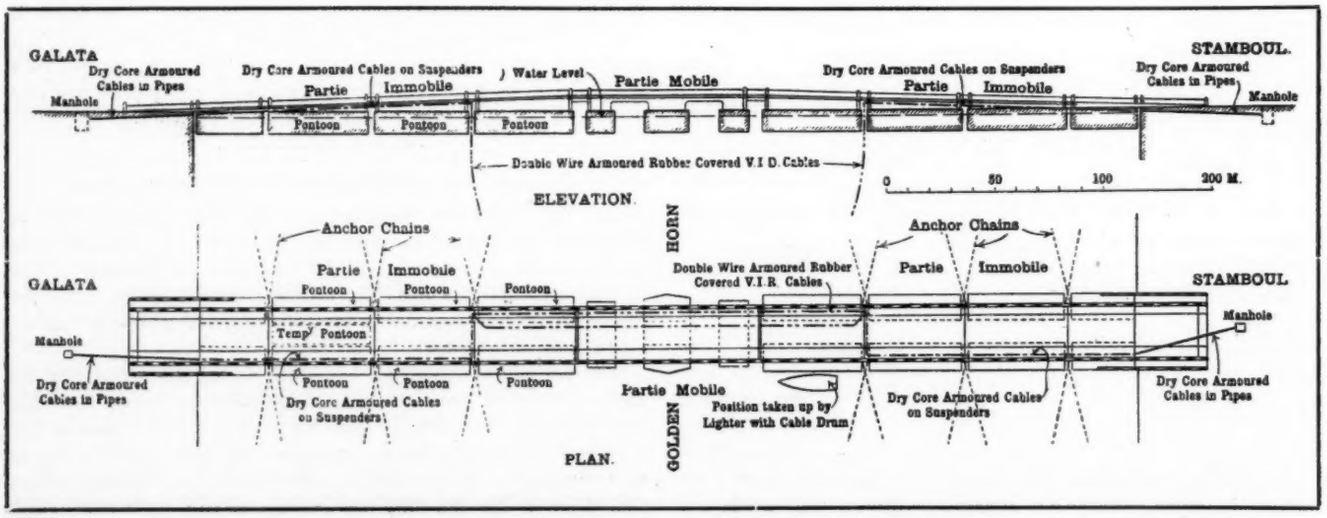


Fig. 1. Diagram Showing Construction of Bridge Between Stam boul and Pera, and Position of Telephone Cables.

conductors, 74 pairs, 20-lbs. to the mile and 126 pairs, 10-lbs. to the mile, paper insulated, lead covered. The lead sheath is served with two reversed layers of compound tape and further protected with 23 G.I. wires, each 6.045 mm. diameter, completely sheathing the tape-served cable. The overall diameter of the cable is 5.6 cm., the distance from the Galata manhole to the submarine cable joint is 114 meters, and from the joint at the other end of the submarine cable to the manhole on the Stamboul side is 183 meters.

The cables are laid in three-inch cast iron pipes between the quay wall and the manholes at either side and take up their positions in the G.I. rings immediately they emerge from the quay wall.

Coming to section 2, or the submarine portion of the crossing, it was considered unsafe to install a dry core, lead covered cable here owing to the impossibility of designing a satisfactory attachment which would not transmit the motion of the bridge to the cable. Two V.I.R. cables have therefore been installed, consisting of a core of 200 pairs of conductors, each wire weighing 20-lbs. to the mile. The sheathing is continuous rubber and is served with two reversed layers of compound tape, which is again covered with 84 G.I. wires each 3.28 mm. diameter. The cable thus formed is again served with two reversed layers of compound tape and is further armoured with 66 G.I. wires, each 4.85 mm. in diameter. To complete the cable, it is again served with two more layers of compound tape.

The overall diameter of this cable is 10.5 cm., and the length of each cable from the joint to the paper insulated cable on the Galata side of the immobile part of the bridge to the joint in a corresponding position on the Stamboul side of the bridge, is 223 meters.

The cable was specially manufactured by the British Insulated & Helsby Cables (Ltd.), and is the thickest telephone cable which has been made at these works. It is indeed probably the thickest telephone cable in existence at the present time.

Owing to the expense of this class of cable and the high mutual electrostatic capacity, it was desirable to keep the length as short as possible; at the same time due regard had to be given to choosing the point of least motion on the bridge. This place is, of course, found at a point midway between the two ends of any given pontoon.

This particular bridge is built up of two rows of pontoons with a space of 8.55 meters running the full length of the immobile portion of the bridge between the two rows of pontoons. For the purpose of renewing or cleaning the pontoons, a spare pontoon is kept which is half sunk and is slipped in between the two rows of permanent pontoons. When in position, it is pumped dry and takes the weight of the bridge off the permanent pontoons at either side of it. These pontoons are then in a position to be unbolted from the superstructure of the bridge and taken out for renewal or repairs as the case may be. The overall width of this temporary pontoon is 8.4 meters, and as the width between the two rows of permanent pontoons is only 8.55 meters, it leaves only 7.5 cm. play at each side of the temporary pontoon when this latter is brought into position.

As the diameter of the cable is, however, 10.5 cm., or 3 cm. larger than the play between the permanent and temporary pontoons, it is obvious that the point of least motion on the pontoon could not be used as a terminating point for the cables.

The only other positions available were found at either end of the first pontoon on each side of the "partie mobile." As it would not have been safe to take up a position at the end of the pontoon where this latter joins the "partie mobile," due to the danger of coming in contact with passing vessels when the bridge was opened, the cables were brought out of the water at a point between the end of the first and second pontoons at either side, away from the "partie mobile."

To lay these cables a steel hawser was placed in position, entering and leaving the water at a point between the two rows of pontoons, in line with the permanent positions which were to be taken up by the ends of the cables. A length of 45 cm. was then cut from the end of the V.I.R. core, and as many of the G.I. armoring wires as possible were passed through the thimble at the end of the steel hawser and made off, the whole make-off being covered with wrapping to prevent the loose ends of the armoring wires becoming entangled with any obstruction.

The cable was then dragged across the pontoons on rollers and passed through the Silvertown friction brake, being pulled through the water by means of a winch fixed at the opposite side of the "partie mobile." A good tension was always kept on the cable by means of the Silvertown brake, which was aided by a three-inch manila rope stopper, to prevent the cable dragging along the sea bed when the cable was pulled through to the winch. The position of the former in the water is indicated by line *A* in Fig. 3. Ropes and blocks were then fixed up at the winch end and 26 meters of cable pulled up on to the pontoon.

More cable was then allowed to pass through the Silvertown brake and rope stopper until it was found that the cable was making an angle of 90 degrees with the water. This end was then pulled over to its permanent position and a special grip attached to prevent slipping. The position taken up by the cable at this stage is indicated by the line *B* in Fig. 3. The 26 meters of spare cable pulled up at the winch end were then slacked out and the end fastened in its permanent position. The cable for the full length had now taken up its permanent position, as indicated by line *C* in Fig. 3.

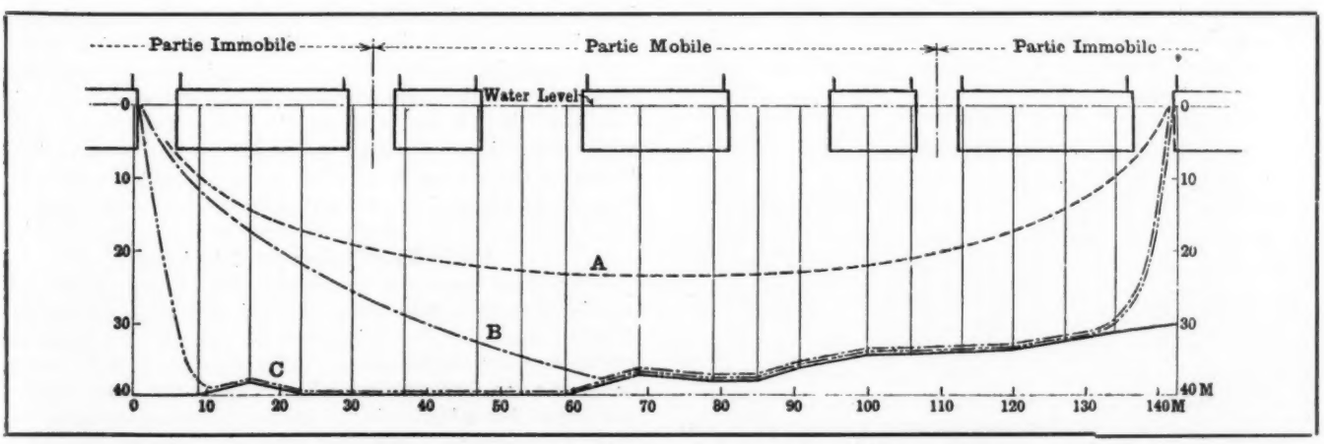


Fig. 3. Arrangement of the Golden Horn Submarine Telephone Cable.

The same process was carried out for the laying of the second cable, the winch and brake being moved some three meters to give clearance between the two cables. This allowed of a greater working space at the winch end and it was found possible to pull up the necessary amount of spare cable by using the winch instead of ropes and blocks, as in the case

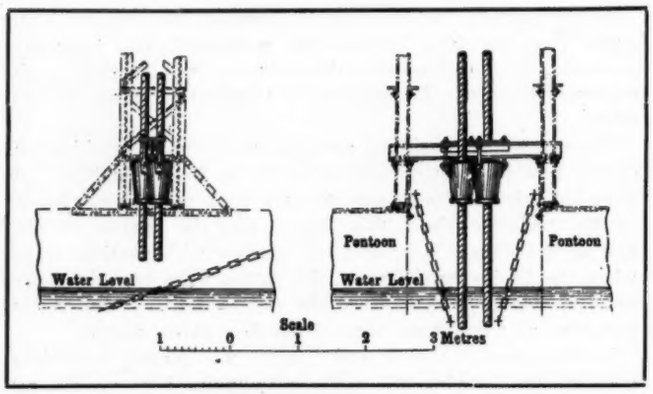


Fig. 4. Cable Anchor at Port Karaking.

of the first cable. While this was being carried out, however, the main cogged wheel of the winch snapped in two, causing the cable to run back with such an impetus that the outer jute covering was stripped off the armoring, for a distance of two meters, by the rope stopper before the cable was brought to a standstill.

The special grip previously mentioned for anchoring these cables consists of a steel-welded, cone-shaped bucket, which is fitted inside with a similarly shaped hardwood wedge through the centre of which the cable passes. Any tendency for this latter to slip resulted in a tighter grip on the cable by the hardwood wedge. The general appearance of this grip in position is shown by Fig. 4.

In case both these cables should at some time or other be irreparably damaged, a 50-pair D.C.L.C.S.W.A. submarine cable is kept in stock, ready to be run at a few hours' notice, through which communication could be maintained until such times as new cables could be manufactured and placed in position when the normal working would be resumed.

It will be noticed from Fig. 1 that that part of the cable crossing which is suspended, is on the opposite side of the bridge to the submarine portion. This position has been taken up as it was found impossible owing to obstructions to place both the submarine and the suspended cable on the same side of the bridge.

London in Need of Telephone Men.

The London telephone service is in urgent need of telephone men. Controller G. F. Preston of government system is advertising for young men willing to learn the work and also for a temporary night man and call office attendant. The controller asks candidates to give the names and addresses of five employers; the business of those five employers; the five positions held by candidate; his salary at each place; his length of stay (with dates) at each place; the cause of leaving and the kind of occupation in the interval. The candidate also is requested to state whether he is married or single and whether he is a natural-born or a naturalized British subject.

The controller advertises that the wage, while learning in the London telephone service work, is $6.25 per week. with a slight increase after efficiency has been attained.

Can a Commission Refuse Permission to Issue Stock?

Has the state railroad commission authority to refuse to permit the issue of capital stock? This question has arisen in the case of the application of the People's Telephone Co., of Sterling, Neb., for permission to issue $50,000 of capital stock to be used in establishing a new exchange in Sterling in competition with the Lincoln Telephone & Telegraph Co., which operates an exchange in that city.

In the application it is stated that the Lincoln Telephone & Telegraph Co. charges $2.50 per month for business telephones and other charges in comparison, and that the service is not good. This, in effect, is the reason why the company desires to establish a new exchange, agreeing to make a rate of $2 for business telephones and others in comparison.

The Lincoln Telephone & Telegraph Co. has filed an objection with the Nebraska State Railway Commission, alleging that a duplication of telephone property at Sterling will result in loss to the stockholders of both companies. It asks the commission to decline to grant permission to the new company to place its stock on the market.

Attorney Ross Hitchcock for the Sterling company declared that under a former ruling of the commission, it does not have authority to overrule an application for issuance of securities because they are intended for a competing or duplicate public service plant. This decision was given in the case of the Omaha, Lincoln & Beatrice Interurban Railroad less than a year ago, wherein the objections of the company to a stock and bond issue of $3,100,000 were overruled.

The Lincoln company has been requested to file a brief by January 1, and the newly organized Sterling company to file a reply brief within ten days thereafter.

Meetings That Develop Chief Operators.

Though they were begun primarily with the intention of increasing efficiency of the operators, the series of local and district meetings of operators and other employes being conducted by officers of the Central Home Telephone & Telegraph Co., of Kentucky, is doing more than that. It is both developing and discovering chief operators. B. Y. Chambers, assistant superintendent, in the office at Louisville, the other day was speaking of the fact that before the series was begun the company was beginning to reach the point where good chief operators would be hard to obtain.

When the organization began to be effective in its work, however, and when the officers and district superintendents began to hear the papers by the girls of the various exchanges, they soon found, Mr. Chambers said, that there would be no shortage of chief operator timber. On the contrary, they found it where they least expected to and, still better, these meetings and participation in them have begun to develop girls of chief operator caliber. Now future needs along this line will take care of themselves.

Uncle Sam Orders by Telephone.

A few days before the parcel post was opened for the public, the post office department found it was necessary to have 5,000,000 tags for the different post offices. A government official was sent to Baltimore, Philadelphia, and New York in quest of a tag manufacturer who could fill the order within a few days. None being able to handle the work, the agent was about to return to Washington when the manager of the last manufacturer visited in New York suggested that he telephone to a tag company of Framingham and see if it could take the order. The call was made and it was found that this company could start the job that ofternoon. The order was given and in one week the 5,000,000 tags were delivered to the United States government. Had the agent used the telephone from Washington, says New England Telephone Topics, in relating the story, the expense of his trip to Baltimore, Philadelphia and New York would have been saved and the order given a day or so before it was.

Looking Backward

A Good Beginning—A Fair Finish

By J. C. Kelsey

You knew him well. He was the meanest man in town. He was the most cordially despised man of your acquaintance. He had a most forbidding character. His misdeeds and grasping tendencies made men fear, as well as hate, him, yet his funeral sermon was a grand recital of the good he had done—not one word of the true condition of affairs.

How mean you felt that you had never discovered these carefully hidden qualities, and how bitterly you regretted those broken windows which the unerring aim of childhood had caused.

"Here lies a lawyer and an honest man." You well remember how that puzzled Pat. He could not understand why two men were buried in one grave when there was so much room.

Pat unconsciously stumbled onto the everlasting idea to give the dead a good send-off whether it was deserved or not. Pat knew that the first was a statement of fact, and the last part of that epitaph was but a romance, really nothing but an effort to speak respectfully of the dead, and to give him a sort of a credential to another land.

"Here lies 1914 and a fine year." The average man, the man out of work, or the man with pay reduced, or one with home and business ruined by war, looking at this epitaph, would pause and wonder how they happened to bury two entities in one grave.

We know that 1914 has been a wicked year. We have felt its grasping, as well as gripping, tendencies. We know of women and children buffeted about by the cruel necessities of war. Men have leaped at each other's throats and lunged at each other with bayonets. Families are starving and fatherless babies dying.

We know all this, but we must not say it. We must speak respectfully of the dead and search about to find something to say which may rest the soul of old 1914.

Ever since the world was born, it seems that some must die that others may live. Some starve that others may eat, and some fight that others may have peace. We know that men become too proud and haughty—that pride goeth before a fall.

We know, too, that a proud and haughty king, named Nebuchadnezzer, was sent out to eat grass and to live on all fours, so possibly 1914 may be the year of our punishment for the big head; and if we are humble enough, we may look forward to something better.

Some men, born to wealth, argue that it is not right to increase a man's pay when it is likely to increase the standard of living, to which he is accustomed; in other words, once a peasant, always a peasant. It is not a pretty thought, yet 1914 may bear out this idea as applied to millionaires as well as to peasants.

It may be, too, that this war is out of men's hands, and was written in eternal history in the beginning of the world. Simply a new process of nature to neutralize the advance of man in civilization—to save him, before it is too late, from some greater disaster. And probably it is to teach us the folly of extravagant ideas and methods of living.

Anyway, we must be kind and let future ages place an epitaph on 1914.

Is 1914 altogether to blame? It is a long ways back to 1906. It was in this year that men were busy; when they built new factories and additions; and when tired men and women worked long and steadily.

It seemed as if the shelves of the world were bare. So great was the demand for everything. Nevertheless the shelves of the world were filling up, and the demand was on the wane. No man knew it, and the activity went on far into the spring of 1907. Each month of that year was better than any preceding month. There was not a cloud in the industrial sky.

There is but one typical enterprise which will show the decline at that time. The decline did not come as a dynamite explosion.

True enough, it appeared to be one, if the action of the banks can be counted as natural. Remember that banks are purely artificial, as well as superficial. They toil not, and never spin. They merely are agencies, and not at all productive.

This enterprise in May, 1907, showed a billing of $260,000 in May; in June it had dropped to $240,000; in July it was $220,000, and in August $200,000. No man knew what it meant. There was a decline of business on, yet no general alarm was sounded. In September the billing dropped to $180,000, and in October it fell to $160,000.

The panic came in October, but it had no effect at all. That shows how little banks have to do with business. In November there was a drop to $140,000; in December to $120,000; in January to $100,000, and in February to $80,000.

You wonder what this has to do with 1914. It has quite a little, and I want to show you 1908 was a bad year, but the succeeding years showed a steady gain, which finally came to a climax in 1913. There was a reason for the gain, and it was purely artificial, too.

The reason for the improvement was entirely due to the automobile industry, which shares its activities with nearly every factory that had machinery and tools.

Had it not been for the era of the greatest human extravagance known to the world we would not be making specific complaint about 1914.

You remember how the rich man in your town exclusively drove a fine team and a carriage, and how it inspired you with great awe. In those days men saved money—and most of them walked.

Today, the hired man on the farm, the lineman in your gang, the clerks in our stores, and people in nearly every walk of life are driving carriages which cost as much or many times more than the rich man's carriage of twenty years ago.

Prosperity once was built up from men's savings and investments. Our last era of prosperity was built up by men's foolish expenditures. No wonder the reaction is so wicked today! No wonder it hurts so. It caught every one in debt, instead of in some sort of affluence.

The year 1914 seems nothing but a rebuke to the foolish extravangances of the past six years. Every one knows that we never really recovered from the over-production which ended in the spring of 1907. Yet every one went

ahead, buying in new cars each year, and they forgot the real trouble in the pangs of joy riding.

Today, we are being asked to settle up, to be sensible, yet you find people who are foolish enough to lay it on the tariff. That cry comes from the parched throat of a hungry and thirsty politician.

A man in Europe earns a dollar. It means to him that he will spend 3 cents next year, and 3 cents every year until the principal of his investment is returned. A man in America gets a dollar. He rushes around, borrows another dollar on the strength of his having a visible dollar, and invests two dollars in a foolish and useless toy, which costs him another dollar currently.

We call ourselves rich, when we really are as poor as turkeys. No man is rich who wastes the principal.

The year 1914 saw the closing and the reopening of the New York Stock Exchange. On the surface of things it looked like calamity.

When the Exchange closed on July 30, it seemed as if every bank and industry was well on the road to ruin. But such was not the case. We managed to live on and to breathe and eat as usual. When it opened its doors this month, we did not feel any different. You were not aware of any seismic shocks at the time.

There was no great and expected deluge of European-owned stock, simply because Europeans had the one dollar in their stockings, and had only been spending the three cents. Nobody but American idiots spends money in Europe, anyway.

When England needed $1,750,000,000 the people calmly oversubscribed the issue without sacrificing one cent. Germany handled her billion dollar levy with ridiculous ease, and France never even groans when she pays her war debts.

In 1914 we have been shown that we are not as well off as we seem, and, as well, not dependent upon stock exchanges and banks as we always thought.

We have seen the federal bank start and ease up money to the greatest degree, yet it did not start up business. To make business good, people must buy and so much banks.

About the only thing we possibly have not learned is that we cannot whip the whole world. That is another great extravangance. Did you know that George Washington had 350,000 soldiers to the 42,000 British?

Let us hope that our brag will not be brought to a test.

Already we see progress in the investment market. Already has the lesson of economy been heeded. The tendency of the times has been to raise the interest on bonds, and it seemed for a time that 6 per cent. was the least income which would satisfy the investor.

Today, the new bond of the Chicago & Northwestern Railway, paying 5 per cent., commands a premium of 8 per cent. This means a march back to 4 and 4½ per cent. for securities of absolute safety.

Those who thought of using 6½ or 7 per cent. bonds may well hesistate, as well as rejoice. Being borrowers, instead of lenders, we cannot deplore a lowering of interest rates.

The year 1914 also shows a tendency toward fairer dealing with public utilities. Big industrial corporations can charge what they please, while public utility concerns are limited not only in income, but are interfered with, even in the affairs of economy.

A curious incident in New York reveals this: The Buffalo & Susquehanna Railroad was built by overconfident capitalists, and it failed utterly.

The owners or receivers have determined to quit business, tear up the rails and ties, and sell off the rolling stock. But it seems that they must get permission from the state utility commission before they can do so. Surely future historians will joke about some of our methods.

On the other hand, and as well contradictory of the hard luck stories of 1914, the Sears-Roebuck Co. earned 23½ per cent. last year. Further, it passed the $100,000,000 mark, growing nearly $10,000,000 in a bad year.

There are banks and other institutions that openly boast of 50 and even 100 per cent. profits, but these concerns are beginning to feel some control, too.

This is shown in the Federal Trade Commerce Act, which will supervise methods of conducting business, particularly for regulating the methods of unfair competition.

Under this act reports must be filed with the commission, the character of contracts shown, and access given to the books at all times.

Remember how hard it was once for even a large stockholder to see the books when the people in control did not want him to see them? It lends a small degree of comfort to the much abused minority stockholder, anyway.

How does this sound, and whom does it remind you of? "Shall not make any lease, sale, or contract of sale, with the understanding that the purchaser shall not use or deal in the wares of competitors."

Do you know of any Independent telephone manufacturer who sells wares to the Bell company?

Here is another clause:

"No common carrier may purchase more than $50,000 worth of wares in one year from any corporation, if the person doing the purchasing is in any way connected with the selling corporation, except after competitive bidding, under regulations provided by the Interstate Commerce Commission."

Does that seem to fit the present condition, whereby the Bell company buys over $50,000,000 worth of goods without competition at all?

Whether or not we are intended to have equal opportunities, we can thank the year 1914 for an attempt to compel it. It may be something like an attempt to stop murder by the penalty of hanging, electrocution or life imprisonment. We realize that it does not stop all the killing, but we know that it stops most of it.

It may be true that the demand by the people that great combinations shall allow open bidding to smaller competitors shall be more or less futile, but a half loaf, or a quarter loaf, is better than no loaf at all.

The year 1914 stands out in another way: Eastern railways have been given a 5 per cent. advance in freight rates. This contest has been waged for several years. We have been told that business will hum when this request would be granted. It does seem reasonable that railroads have had our problems of higher expenses and lowering income, but there is doubt in my mind, at least, that this rate increase will cause any great leap in activity. It will help in the natural recovery.

Crazy legislation seems to be on the wane, although Illinois is considering a law limiting freight trains to 50 cars, and Kansas is talking about knocking out advance payment for telephones.

The first idea is a silly interference with a natural economy, while the second idea is an absurd contradiction to common sense. Will it extend to paying for theater

tickets after the show, or paying for railway tickets after the trip is over? Possibly.

Each state's attempt at silly interference is merely a dying gasp of old habits of making political capital out of assaults on corporations.

The clearest record of 1914 is the showing of telephone systems. The Bell system will show a gain of $4,000,000 gross, although last year it was near $12,000,000—it was a gain, anyway.

Very few telephone companies have stopped dividends, and there have been no specific failures to pay bond interest. It looks as if the last failure, great or small, was recorded before 1914.

Best of all, we know that prosperity is not an explosive. It does not come or go at any man's bidding. It is a slow moving condition, both going and coming.

We know that money does not make business, and we may yet learn that increased railroad rates do not. We may yet have to go back to the natural law of supply and demand, for man in his pride, has believed in his power to overrule this law.

"Here lies 1914 and a fine year." The propriety of the epitaph depends upon what is meant by the word fine. If the world is measured by mere money gain or loss, it has been a rotten year. If the world still has any sentiment, whatever, 1914 has been a fine year, because of the lessons it has taught.

MORAL: It might have been worse.

Telephone Installation at Panama-Pacific Exposition.

The designing of a telephone system for the Panama-Pacific International Exposition presented many problems. Added to the large area to be covered, was the installing of a system intended only for temporary use and the necessity of keeping the expense of installation at a minimum. The department of mechanical and electrical engineering, under the supervision of Guy L. Bayley as chief, has designed a system that is comprehensive in its details and entirely adequate to meet the demand placed upon it.

The Exposition grounds cover an area of 625 acres and are divided into four sections, as follows: Amusement, concessions, exhibit buildings, state and foreign buildings and live stock, athletic field and race track. There are 150 concessions in the concessions district and 2,000 exhibitors in the 15 exhibit buildings. The executive offices of the Exposition are in the California building, which also houses the exhibits from the 58 counties of the state. There are 200 buildings, large and small, in the state and foreign buildings section, and five in the live stock section.

The entire system of wires and cables is placed in underground conduits composed largely of fibre duct. Iron conduit is used where water is near the surface of the ground. The conduits are laid in wooden troughs and packed in sand, except adjacent to the manholes, where concrete is used. The conduits also carry the electric light and power wires. This gives economy of space and installation. There are 150 manholes, 47,500 feet of two-inch and 376,500 feet of three-inch conduit, not including short runs of iron conduit connecting numerous small buildings with the main cable system.

In determining the number of subscribers' lines necessary, each of the four sections of the grounds and the large exhibit buildings, were considered separately. The area, the number of buildings in any proposed distribution district, and the types of the various exhibits, were all studied closely. A system of 1,000 lines was deemed sufficient to give adequate service.

A large cable is run to the center of each section and through a cross-connection box feeder cables branch off to other points. In the buildings twisted paired wires, supported in rings, run along the trusses or under the floors. In the state and foreign building section, where there are 200 buildings to be accommodated, a large cable is run into several of the larger buildings, while feeder cables suffice for other points. Weatherproof wires in conduits are run to buildings where the stations are isolated. In the concessions' district all buildings are connected from the rear. The entire underground plant comprises 41,000 feet of cable, 4,500 feet of which is 200 pair cable.

The switchboard is located in the Food Products Building. It is a five-section board of standard design, with 15 positions. There is also a chief operator's desk and a four-position information desk. The equipment includes a storage battery plant, charging generators and ringing machines. The board is equipped with five-panel multiple and auxiliary answering jacks, 200 for incoming and 160 for outgoing calls. Attended public pay stations to the number of 32 are installed at convenient points, including one in each exhibit building. There are five to ten booths comprising each station.

Individual measured rate service will prevail as regards the charges for the telephones, except in the case of restaurants and concessions, where coin collectors will be used.

A 400-pair cable connects the system with one of the exchanges of the local company in San Francisco to handle the incoming and outgoing city calls. A special composition cable provides facilities for long distance service. All stations will handle local or long dstance calls.

The Registration and Information Bureau, which is unique with the Exposition, is available through any of the stations. Friends becoming separated can telephone their whereabouts to the bureau and be reunited in short order. Messages of any kind, limited to 20 words, can be telephoned in and listed. When the party desired calls in, the message will be read to him. This message can be sent in from any of the stations on the Exposition grounds or will be accepted as a "collect" message when sent in from outside stations, the party called paying the charges. Lost children can be easily located by this means.

Wonderful Service!

During one of the busiest hours at our pay station at the Union Station, a middle-aged business man pushed his way through the crowd standing around the desk, says Agnes M. O'Connell in the Southwestern Telephone News. In a very excited manner he went into the second booth without closing the door, dropped his nickel in the slot and called for Olive 123.

Not two seconds later, a second middle-aged man went into the first booth, also left the door open and called for Olive 123. It so happened that the calls were sent to the Olive office at exactly the same time and two Olive operators testing at the same time, found the line clear and put up connections. Olive 123 did not answer, but the following conversation took place between the two men calling:

"Hello, who is this?"

"This is Jones."

"Jones! Why this is Smith. I came down to the Union Station to meet you and must have missed you. But how in the world did you get to the office so soon—your train has been in not more than ten minutes?"

"I am not at the office—I am at the Union Station. "I—"

"Union Station? Where are you?"

"In one of the telephone booths."

"So am I, well—"

And then they both stepped out of the booths, shook hands, threw their arms around each other, and amid the laughter of all the bystanders, went on their way thoroughly convinced that the telephone service from the Union Station is wonderful.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities and Actions of City Councils Bearing Upon Franchises, Rates and Service

The New York Telephone Rate Case.

It was brought out at last week's hearing in the New York Telephone Co.'s rate case before the New York Public Service Commission that the records showed the company paid to the American Telephone & Telegraph Co. 4½ per cent. of its gross earnings as a license fee for the use of Bell telephone patents. Although this was generally known by telephone interests, it created much comment in the public press.

It was pointed out that the New York Telephone Co. is owned to its last share of stock by the American company, the parent corporation, therefore, deriving the full benefit of the dividends, in addition to the license charges. In view of this, there was some agitation to call officials of the American Telephone and Telegraph Co. to testify in the case, on the ground that the New York Telephone Co. was merely acting in accordance with the views of the parent concern.

The commission's accountant, Dean Langmuir, reported that the books of the New York Telephone Co. showed a profit and surplus of $21,958,180 at the time the inventories were taken, and that only 5.6 per cent. of the total revenue was derived from tolls outside of greater New York. This latter estimate was regarded as of particular bearing, inasmuch as it is the task of the investigators to segregate the revenue outside of the city from that inside, so as to be able to determine the basis of rates in the city proper. The telephone company has maintained that it should be permitted to fix its rates in New York City after it included the earnings of all its subsidiaries in the state in the general apportionment. The accountant's testimony would seem to indicate that the New York City system's earning capacity was practically independent of the other systems in the state.

It was shown that the total toll revenues of the company amount only to 15 per cent. of all the company's revenues, and of this percentage, about one-third is derived from toll charges for messages between New York City and places up the state. Figures introduced showed that it cost the company 30 per cent. of its revenue to operate the service in New York City. According to Mr. Langmuir, for the six months of this year ended June 30, the exchange service revenues of the company were $12,065,885, and the total service revenues amounted to $2,579,788. Of its gross revenues, he said, the books showed that the company paid to the American Telephone & Telegraph Co. 4½ per cent. as a license fee, amounting to $654,638. Th gross revenues for the six months' period amounted to $14,039,278, after certain necessary deductions.

Total operating expenses for the six months were $7,658,916, and the net revenues amounted to $6,380,361 for the same period. In addition to its revenue from operations, the company had a revenue of $1,999,099 from securities it held. According to the witness, the total non-operating revenues of the corporation for the first six months of the present year were $2,905,690.

Questioned by Martin W. Littleton, counsel for the corporation, the witness gave the percentages of distribution by boroughs of the telephone company's ground and buildings, central office equipment, station apparatus, etc. The total plant and service which with material and supplies were shown to be valued on the books of the company at $67,820,336, were divided by boroughs as follows:

Manhattan and the Bronx, 67.9 per cent.; Brooklyn and Queens, 30.2 per cent.; Staten Island, 1.9 per cent. The percentage of the toll revenues derived from calls within the greater city, he gave as 63 per cent. The remaining 37 per cent. of the toll revenues was made up as follows: From points within the city to points without, 20.4 per cent.; calls from without to zones within the city, 13.6 per cent.; calls to and from New York City passing through New Jersey, 2.2 per cent.; and calls between outside points passing through New York City, .8 per cent.

Seymour Van Santvoord, chairman of the commission, presided at the hearing. Sitting with him was Commissioner William Temple Emmet. The legislative special committee on telephones was represented by Senator James A. Foley, chairman; Senator Herbert P. Coats, of Saranac Lake, and Robert S. Waterman, of Ogdensburg, assistant counsel. The New York Telephone Co. was represented by John L. Swayze.

Government Ownership Urged by Postmaster General.

In his annual report to President Wilson, Postmaster General Burleson recommended that early action be taken looking to government ownership of telephone and telegraph facilities. The postmaster general also urges that the telegraph and telephone systems of Alaska, Porto Rico and the Hawaiian islands, including the Alaskan cable now operated by the war department, be immediately taken over and operated by the postoffice department.

Postmaster General renews the recommendation embodied in his last annual report that congress seriously consider the question of declaring a government monopoly over all utilities for the public transmission of intelligence and that steps be taken as soon as practicable to incorporate into the postal establishment the telegraph and telephone systems of the country.

In the report reference was made to the anomalous condition in this country under which the telegraph and telephone utilities, being vehicles for the public transmission of intelligence, infringe upon a function reserved by the constitution to the national government. They inherently, as well as constitutionally, belong to the postal service. That it has been the policy of this government to ultimately acquire and operate these electrical means of communication as postal facilities, as is done by all the principal nations, the United States alone excepted, is evidenced by the fact that the first telegraph line in this country was maintained and operated as a part of the postal service, and further by the act of July 24, 1866, which provided for the government acquisition of the telegraph lines upon the payment of an appraised valuation; and again by the act of 1902, which directed the postmaster general "to report to congress the probable cost of connecting a telegraph and telephone system with the postal service by some feasible plan."

The data which the postmaster general was engaged in reviewing when his last report was prepared, has since been submitted to congress in compliance with a senate resolution. The firm conviction of the department is reiterated that telegraph and telephone service is inevitably monopolistic and, when operated under private control, does not render the maximum of public service at the minimum cost to the whole people.

It is an interesting fact that, whereas policies of govern-

ment have been advocated and some adopted, the constitutionality of which has been seriously questioned, the principle of government ownership and control of the telegraph and telephone finds its greatest strength in the constitution. This opinion has been shared by practically all postmasters general of the United States, who have held that the welfare and happiness of the nation depend upon the fullest utilization of these agencies by the people, which can only be accomplished through government ownership.

Biennial Report of Kansas Public Utilities Commission.

The biennial report of the Kansas Public Utilities Commission recently filed with Governor Hodges, shows that the commission has disposed of 603 cases on the docket in the two years of its present organization. In the report it is also shown that the cases filed upon the regular docket from November 1, 1912, to November 30, 1914, include 143 rulings pertaining to telegraph and telephone companies.

The character of the cases filed with the commission, pertaining to telephone companies, include applications to adjust or raise rates, to sell or purchase telephone property, applications for permission to discontinue or re-establish service, to establish toll rates, etc.

Kansas Governor Opposes Advance Rental.

In a letter to members of the Kansas Public Utilities Commission last week, Governor Hodges urged the issuance of an order prohibiting the collecting of telephone rentals in advance. Following upon the heels of this recommendation to the utilities commission, it is said that the legislature will be asked to intervene and enact a law prohibiting the collection of fees or rentals by any public service corporation until such service has been delivered.

Governor Hodges feels that Kansas telephone patrons are victims of an injustice at the hands of the Missouri & Kansas and other telephone companies, which practice the advance monthly rental policy. He has received numerous complaints against the practice and in his letter to the commission, urged the issuance of an order terminating such policy in the state. The letter is as follows:

The companies collecting these rentals in advance are conducting their business to a considerable extent upon capital belonging to the general public. I mean by this, that they are collecting for service yet to be rendered and, to an extent, are doing business on capital belonging to the general public, which is unearned except in the sense that the companies are under obligation to furnish future service to the extent that it has been paid for.

Other public service corporations, such as gas, water, electric light and power, do not collect for service yet to be rendered. It is equally as consistent, it seems to me, for the public service corporations named, to collect a minimum fixed charge in advance for service yet to be rendered as it is for telephone companies to collect rentals in advance— the only difference being that telephone companies have definite charges while others could but approximate the charge.

I cannot persuade myself to believe that it is either just or right for citizens to be called upon to pay in advance for such telephone service when other utilities do not collect in advance for the service they anticipate rendering.

My attention has also been called to the fact that there is no uniformity in the charges for various kinds of service rendered by telephone companies and it seems that the time has now arrived when this matter should be taken up and investigated, and that you establish a correct basis for telephone rates for the different kinds of service rendered.

In discussing his letter, Governor Hodges not only expressed a desire to prompt action on the part of the Kansas Public Utilities Commission, but hoped for an enactment at the hands of the legislature remedying the present situation.

"I think it is safe to say that one-fourth to one-fifth of the funds used for operation, if not establishment of telephone plants is derived through this method of collecting rentals in advance," said the governor. "The worst thing about it is that there is no justification for the telephone companies' course. A grocery store sells a man some groceries and fails to collect its bill—the groceries are gone. The same is true of the coal man or the clothing merchant. But if a telephone subscriber fails to pay his rent, the telephone can be removed and the only loss is a little local service. I really think the risk of a telephone company is less than that of any other business or public utility and hope that the present system of collecting rentals in advance will soon be abolished."

Telephone Situation in Ottawa, Kansas.

A detailed explanation of the plan proposed by W. P. Hemphill to acquire the Home and Bell telephone companies now operating in Ottawa, Kans., was given at a hearing held December 16. The hearing was on the application of Mr. Hemphill for permission to acquire the telephone properties in Ottawa and finance a new company to be known as the Kansas Telephone Co.

Mr. Hemphill's plan provides for the issuance of bonds not to exceed $750,000. He estimates that it would require $128,000 to buy the two plants and proposes to spend $175,000 in improving the system. The plan includes the issuance of $150,000 worth of bonds and $25,000 capital stock. A continued hearing in the same case was held on December 23.

Telephone Clearing Switch in South Dakota.

The South Dakota Railroad Commission has handed down an order in response to various complaints filed in regard to the practices of the Cavour, Iroquois, Esmond, Carthage and Farnsworth co-operative telephone companies. The ruling of the commission orders the discontinuance of the routing of messages between exchanges through the Farnsworth switch.

Farnsworth is a small switching station in the country, which is a central clearing point for a number of rural lines touching railway towns in different directions. Complaints were made to the commission in regard to practices of these companies, and the manner of handling the business at the clearing switch. In many cases messages which originated at town exchanges in touch with some of these rural lines were routed through the Farnsworth switch to other lines without a charge. On this case the board cites a former decision, which is:

"The intercommunication between subscribers of a local exchange and its connecting lines is properly considered as exchange business, whereas, when there is communication over a line between two exchanges or units, this is properly considered as toll business. Toll business or toll messages should properly be transmitted over lines to which no other telephone instruments are attached. If these rules are observed, the distinction between toll business and exchange business is quite plain. The toll line was originally installed and adopted for the transmission of messages between points at some distance from each other, and if this same rule is applied, it will be readily seen that toll messages are those which are transmitted between telephone units or telephone exchanges."

Minimum Wage Law Discussed in the Supreme Court.

The fate of all laws providing minimum wages for women hangs on arguments made in the supreme court of the United States last week. The case involves the constitutionality of the Oregon law, and on the decision depends the status of the laws of Washington, California, Colorado, Wisconsin, Minnesota and Utah and prospective laws of nine other states, including New York, Missouri, Kentucky, Louisiana, Connecticut and Illinois.

Arguments in behalf of the law were presented by Louis

D. Brandeis, of Boston, and Attorney General Crawford, of Oregon.

"The real question," said Attorney Brandeis, "is whether the state legislatures, having limited the number of hours women may work and provided for their safety in factories, may also protect the community against injury to the health of its people, corruption of their morals and the dependence and degeneration of the people.

"It has been shown by investigation that the payment of lower than living wages produces these results."

Former Senator Chester W. Fulton, of Oregon, attacking the law, said:

"If it is true that the wages of women are not sufficient to give them comforts, why is it the fault of the employers? Why not pass laws to reduce the price of comforts?"

The Oregon law creates an industrial welfare commission, with power to fix rates of wages for women, hours of work and other conditions of service.

Summary of State Commission Hearings and Rulings.

ARIZONA.

December: Order authorizing the Mountain States Telephone & Telegraph Co. discontinue its exchange at Miami, Ariz., the patrons to be served by a direct trunk line from Globe.

CALIFORNIA.

December: The Roseville (Cal.) Telephone Co. has filed an application with the commission for permission to issue $4,000 of stock to provide for additions and betterments during the coming year.

January 19: Postponed hearing in the case filed by District Attorney-elect Barclay McCowan to secure a reduction in the rates charged by the Pacific Telephone & Telegraph Co. in Bakersfield, Cal.

COLORADO.

December: Ruling prohibiting the granting of free long distance telephone service to citizens and towns by public utilities in Colorado.

IDAHO.

December 7: Application of the Pacific Telephone & Telegraph Co. for permission to place into effect a new schedule of rates between all points in the counties of Latah, Lewis, Nez Perce and Idaho, denied. The commission, upon investigation, found that the effect of the schedule would be to increase many of the rates now in effect.

ILLINOIS.

December: Application of Illinois Telephone Co., of Jacksonville, for permission to establish toll charges on service to Franklin, dismissed.

December 17: Central Union Telephone Co., at Peoria, Ill., ordered to discontinue discriminatory rates to certain subscribers and to continue furnishing service at reduced rates as per franchise agreement to the county and city of Peoria until the commission can establish permanent rates.

December 17: Complaint of Jesse O. Brown, of Hillsboro, against the Montgomery County Telephone Co., dismissed, for want of prosecution.

December 18: Pike County Telephone Co. authorized to charge $3 instead of $1.80 for switching charges at Bayliss,

December 17: Western Union Telegraph Co. authorized to sell a part of its equipment at Murphysboro to the Murphysboro Telephone Co., and others.

December 17: Order permitting the Adair Telephone Co. to discountinue discriminatory rates.

December 17: Agreement between the Mt. Auburn Telephone Co. and O. G. Overmier to operate lines in connection with each other at Mt. Auburn, approved.

December 17: Agreement between receivers of Central Union Telephone Co. and the North Henderson Telephone Co. to operate their lines in connection with each other at North Henderson, approved.

December 17: Agreement between Freeport Telephone Exchange Co. and W. H. Phelps of the Winslow Telephone Co. to operate their lines in connection with each other, approved.

December 17: Rock Grove Telephone Co. permitted to discontinue discriminatory rates.

KANSAS.

December: Petition filed by the Missouri & Kansas Telephone Co. for permission to discontinue its service at Eudora, Kans. The company alleges that the Eudora exchange is not yielding a profit and asks permission to discontinue all but long distance service.

December: The Missouri & Kansas Telephone Co. has filed an application for permission to raise its rates at Parsons, Kans. The company represents that the present rates are not remunerative, and asks permission to increase individual line business rates from $2.50 to $3 a month; two-party business telephones from $2 to $2.50; residence telephones, single, from $1.50 to $1.75, and two-party lines from $1.25 to $1.50 a month; also to install four-party lines at $1.25 a month.

December: Application filed by the Haven Telephone Co., of Haven, Kans., for permission to discontinue service at Yoder.

December: The Eastern Kansas Telephone Co., of Kincaid, Kans., has filed an application for permission to discontinue free service between Kincaid and Blue Mound, and to charge 10 cents a call between the two towns.

December 16: Application filed by the Baxter Telephone Co., Baxter Springs, Kans., for permission to increase its rates.

December 23: Continued hearing on application of W. P. Hemphill for a certificate of convenience to acquire the Home exchange in Ottawa, Kans., and the Home company's option on the Bell plant and to reorganize under the name of the Kansas Telephone Co.

MICHIGAN.

December: Complaint filed by Shelby B. Schurtz of Grand Rapids, against the Citizens' Telephone Co., of Grand Rapids, that the telephone company has issued only one directory in the last 11 months. Mr. Schurtz alleges such infrequent publications do not give the public good service. The commission has asked the company to make answer to the complaint.

MISSOURI.

November 10: Application of L. F. Moore, A. T. Bundren and A. E. Welty for the sale of the Laclede Telephone Co., Laclede, Mo., granted. Case 536.

November 21: Application of Fred and Gertie Goller to sell and August C. Luckenhoff to buy the telephone exchange at Argyle, Mo., granted. Case 549.

November 28: The Missouri Union Telephone Co., of Windsor, Mo., authorized to buy and the Urich Telephone Co., of Urich, Mo., authorized to sell its exchange at Urich for $7,500.

December: In the complaint of the Doniphan Telephone Co. vs. the Neeleyville Telephone Co., the complainant claiming that the defendant had established a second local exchange in Naylor, Mo., in violation of section 96 of the public service commission law, the commission held that a certificate of public convenience and necessity was not required. Case 471.

December 1: Application of Schell City Telephone Co., of Schell City, Mo., to issue stock to the amount of $10,000, granted. Case 555.

December 5: Complaint of Chas. B. Butler vs. the Doniphan Telephone Co., Doniphan, Kans., alleging discriminatory reduced charges to doctors, sustained, notwithstanding an ordinance requiring the same; $6 per year reduced rates to rural party line subscribers furnishing and maintaining substation equipment. Case 416.

NEBRASKA.

December: Application filed by the Valparaiso Telephone Co., Valparaiso, Neb., for permission to increase its rates. The company desires to change its system from grounded to metallic and proposes to increase the rate for business telephones from $1.75 a month to $2.50, and residence and farm telephones from $1 to $1.50 per month.

December 10: Continued hearing in the application of the People's Telephone Co., of Sterling, Neb., for permission to issue $50,000 capital stock to be used in establishing an exchange in Sterling in competition with the exchange of the Lincoln Telephone & Telegraph Co.

December 22: Hearing held on application of the Monroe Independent Telephone Co. for permission to increase its rates in Monroe and Platte Center, Neb.

NEW YORK.

December 26: Final hearing in the case of the complaint of telephone subscribers in Utica, New Hartford and Whitesboro against the New York Telephone Co. on account of the increase in rates and tolls, effective November 1, 1913.

SOUTH DAKOTA.

December: Application filed by the Dakota Central Telephone Co., which operates exchanges at Pierre and Fort Pierre, to continue the two towns under one exchange with an increased rate, or to slightly modify existing rates in each of the towns and place the business between the two towns on a toll basis.

December: In response to complaints filed in regard to the practices of the Cavour, Iroquois, Esmond, Carthage and Farnsworth Co-operative telephone companies, the commission handed down a ruling ordering the discontinuance of the routing of messages between exchanges through the Farnsworth switch.

Local Telephone Operating Rules and How Developed

A Serial Story Dealing with Local Operating Terms and Rules—Reasons for Their Use—A Real Study of Rules Beginning with Fundamentals and Developing All Essential Factors in Operating Room Practice, for Both Small and Large Exchanges

By Paul Hamilton

"I see all are present in spite of the fact that Archer Grove outlies somewhat," Mr. Prince remarked, as he called the meeting to order. "I regret the governor has not forwarded any message, complimentary or otherwise. In fact we haven't attempted to make a blotch on the fair name of the state to call forth his intercession."

"I guess the experience at Shawtown proves the impossibility of enforcing the laws in this state under the present administration," Mr. Hussey stated in defense of his home city.

"Let us hope then that the laws will be generally observed during the present regime," Mr. Carney remarked.

"If I remember correctly we were drawing near the task of actual rule making," Mr. Prince stated, addressing the meeting.

"We have not prepared the applicant for initiation into the why's and wherefore's of the simplest phrase as yet," Mr. Burke answered. "Doc Tully used to say, 'There are tricks in all trades, but the trouble is that too many learn the tricks and let the trade go hang.' We are just canvassing the possible tricks. We will come to the trade later, perhaps."

"I believe with Mr. Burke that there are other things to be considered," Mr. Carney observed.

"Where do we go next Thursday, week?" asked Miss Floyd.

"Perhaps we had better determine that essential matter," said Mr. Prince.

Princeville was selected as the next meeting point, even though Mr. Carney voiced a spirited protest.

"Under what general heading may we classify the next series of topics to be given consideration?" Mr. Prince asked.

"We have considered all that may be termed general physical requirements. Mental requirements or essentials are quite numerous; two of them are concentration and memory," spoke up Mr. Carney.

"Take the first, 'concentration': I presume that means the ability to fix one's mind upon the matter in hand," said Mr. Prince. "How can that be determined?"

"Will not one's observation of the applicant's attention to the preliminary tests prove that to our satisfaction?" Mr. Telson inquired.

"Well, for instance, what request or requirement have we thus far, which will demonstrate a power to concentrate?" asked Mr. Carney.

"Her general attitude in observing what may be said to her," Mr. Telson replied.

"I fail to see it that way," answered Mr. Carney.

"Why is this concentration, as you call it, an essential?" Mr. Walters asked.

"An operator must be able to shift her mind or attention from one connection to another almost instantaneously," explained Mr. Carney. "Having completed a connection, she must put her mind upon the next in an undivided manner. She may, a moment later, have to revert back to the previous connection, but it must be an entirely new effort. The power of concentration is a real element in successful operating.

"The same principle applies to any business or profession," Mr. Prince volunteered.

"But not to as great an extent," Mr. Carney argued.

"Anyway, we all admit of its importance," asserted Mr. Prince. "Mr. Walters by his silence, appears to accept Carney's statement."

"I can see where it is an important element," admitted Mr. Walters.

"I have yet to determine to my own satisfaction, how we can determine this trait more effectively than in the attention the applicant pays to what is said to her during the preliminary tests," Mr. Telson still maintained.

"I think it possible to go further than that, however," Mr. Carney argued. "For instance, it is possible to give the applicant a problem, or written statement, allowing her to devote, say three minutes to studying, and afterward either write or repeat the substance, but not particularly the language used in it."

"That is more of a test of memory, isn't it?" Miss Floyd inquired.

"The two bear a close relationship to each other, I must admit, but there is a difference. A person can scarcely memorize without concentrating, but they may concentrate and not memorize. They may, however, concentrate and retain the full meaning of a proposition in a more comprehensive manner than if memory had retained the exact words. My theory may be wrong, but I try to make it answer my purpose."

"Why doesn't memory cover the case?" Miss Sible inquired. "If one must concentrate to memorize, I do not quite see the distinction."

"The question may then be resolved into this," said Mr. Prince. "In her work as an operator, when can we draw the line between concentration and memory?"

"Take it as a general question, omitting the application to operating," Mr. Carney argued, "and define the difference. Take our own selves, for example. Suppose tonight each one of us should undertake to consider our discussions at the conferences, we have held. Concentration would be the first thing, and through that the memory would reveal what had been recorded there. Some may be more gifted with the ability to memorize than others."

"That statment is very true," Mr. Burke affirmed. "But is the power to concentrate as valuable to a person having a poor memory, as to one with a good memory as well?"

"It would be my advice to those having a poor memory, to cultivate and practice concentration. Perhaps I can illustrate the point by relating a family circumstance. I have two aunts, of about the same age, who have lived within visiting distance in the same little town in 'York' state as they call it, all their lives. Aunt Tilly claims to possess an infallible memory, while Aunt Ann makes no such boast. Aunt Tilly will make a flat statement that a certain death, marriage, or fire, occurred in a certain month of such a year. Aunt Ann is skeptical of Aunt Tilly's statements, and quite often expresses her doubts. This brings a very emphatic confirmation from Aunt Tilly.

"Aunt Ann will then concentrate her mind upon the subject for a few minutes and come back with some such an argument as this:

"'It couldn't a been '82, Tilly, that Benson's house burned the first time. You know, and I know, that Uncle Ben Colby built the new one, and Uncle Ben fell off the

Campbellite church when they was building that and it says right on the front that it was built in 1881, and Uncle Ben never worked after that. It was in 1880, that's when it was, and you worked that year for Mrs. Culver, and Jim and you went to the fire in the buckboard, an' you wasn't married till two years after that, and you was married in 1882.' By concentration, Aunt Ann will prove her case with an indisputable record of circumstances."

"It appears then, the main difference is that when one concentrates, the power of reason is brought into play," observed Mr. Jackson.

"I think that is the difference," Mr. Carney agreed.

"It seems plain that if we can reason a thing out once, we can do it a second time by concentration," Mr. Prince observed. "But we all know we may draw accurately from memory today, and yet tomorrow some point may be lacking."

"I can see where both traits can be compounded to great advantage," said Mr. Burke. "In fact I do not see just how a separate test can be made."

"Perhaps Mr. Carney will favor us with his method," Mr. Prince suggested.

"Well my method may not be orthodox but it is this," Mr. Carney answered. "I have two lists of ten words each. Suppose you each write them down. List number one contains the following:

"'Wagon, horse, harness, driver, whip, road bridge, hill, town and home.' Here is list number two:

"'Chair, iceberg, post, chimney, leaf, stone, wheel, map, tree and cloud.'

"Look over each list and ascertain what general difference there is," Mr. Carney requested.

"It will require concentration, if I am any judge," Mr. Burke observed.

"Shall we ask permission to speak when we feel we have mastered the problem?" Miss Floyd inquired.

"Speak up whenever the spirit moves you," advised Mr. Prince.

"Well then, the first list is a chain of words, each word suggested by the one preceding it. In the second list, each word stands alone and unsupported," said Miss Floyd.

"Miss Floyd has caught the idea," Mr. Carney answered. "Each word in the first list is suggestive of the one following, taken together, they form a chain and can be connected into a story so to speak. An applicant, who is capable of concentration, will memorize the first list very quickly and perhaps fail to do so with the second in the same length of time. The applicant, dependent upon memory only, allowing her eyes to convey the words to the brain, will memorize either list in about the same length of time."

"Then your method proves both memory and concentration at the same time?" concluded Mr. Telson.

"Well yes, I presume you may take it that way. It is my custom to give out one list immediately following the other," Mr. Carney explained.

"In the order in which you gave them to us?" Miss Sible asked.

"Usually, because I consider the first list the test of concentration."

"Why not make them into one list of twenty words?" Mr. Prince asked.

"I have not considered such a plan, but upon first thought it would be presenting what would appear as too great a task. By dividing it into two parts, it makes but two small tasks. That might be accepted as one reason. Then another difficulty I can see, is that even a girl with an exceptional memory would stumble near the end of the list. The time would be so uniform, whatever her ability, that I could not determine the two factors I desire."

"Wherein do these two essentials affect our operating methods?" inquired Mr. Walters.

"Have we finished the discussion of Mr. Carney's method?"

"I have heard of another method of determining concentration, but it appears to me a little more elaborate than we can make general use of. That is, to give the applicant a rule book to read and have attempts made by operators to attract her attention. Some girls will read page after page, and at the same time hear every word that is said within range of her ears. Others are able to concentrate upon the rule book and pay no attention to what is happening around them."

"The list plan looks more practical," said Mr. Prince. "The whistle at the brush factory is blowing. Go to the windows and see the blind boys march down the street. They go back to school for dinner. The factory is connected with the institution for the blind and they an employed there six hours a day after they pass a certain grade."

"Can't the man leading the way see?" some one inquired.

"He is totally blind," replied Mr. Prince.

"You would hardly notice that any of them were so afflicted," was the comment generally expressed.

After a few minutes' recess, the discussion of essentials was resumed.

"Mr. Carney, will you answer Mr. Walters' previous question?" Mr. Prince asked.

"It seems to me that I have done more than my share of the talking this morning. However, in my opinion a girl who is not concentrative, must first learn the rule and then its application; she may forget either half of the equation and supply the wrong factor when the time arrives. A girl of the other class will fit the rule to a logical reason. She may forget the 'word for word' feature, but she can concentrate and fit the circumstance with the rule. In other words, she will reason the thing out."

"It seems to me," Mr. Prince added, "that the last mentioned class would be more useful when a peculiar case for which there is no set rule, should come up."

"Those are the things that upset our service more or less," observed Mr. Jackson.

"'There is nothing new under the sun'," quoted Mr. Burke.

"I think," said Mr. Jackson, "while many points have been brought out, many of them are new to most of us. I think also we will find it so, when we come to the discussion of regular operating difficulties. I would like to ask Mr. Carney as to the length of time he considers sufficient for an applicant to learn the lists he uses?"

"In one sense I do not care if she learns them or not. I give an applicant five minutes to study each list. There is no reason why she should learn these words."

"I understood you to say that you used the time required as a basis for your consideration of her ability?" Miss Sible stated, questioningly.

"I may have used words which gave that impression, in fact, I think I did. It is, however, the progress she makes in a given period that I consider."

"I believe I should use the other method," Miss Sible decided.

"I would suggest a list of words made up from names of the apparatus she is to use in her work, plug, cord, jack, key, etc. They would bear no relation, one to another, on the start."

"Operators sometimes feel interested in a prospective student and will, in many cases, render her every assistance in her power to qualify. For that reason I change my list of words quite frequently."

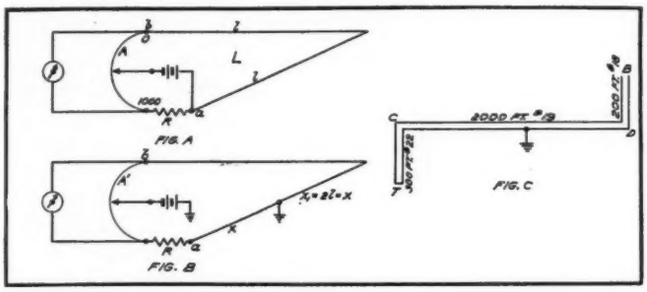
"Adjourned until two-thirty," announced Mr. Prince, noting that it was nearly one o'clock. "I think the hotel people will be ready to take care of us now."

(To be Continued)

Practical Subjects—Letters and Discussions

A Convenient Varley Formula.

In making the Varley loop test, the usual method is to measure and calculate the resistance of the loop, and then to measure and calculate, by the substitution of this value, the resistance to the fault; and, finally from the wire tables or the loop resistance together with the length of the loop,



Varley Loop Connections and Application.

the distance to the fault is determined. With the slide wire or fault finder type of bridge, this requires three separate calculations involving decimal fractions.

The following formula has been found to save much time as well as to reduce the liability to error in calculations on account of its simple form:

$$x = \frac{A - A_1}{A} 2l \text{ or } x_1 = \frac{A_1}{A} 2l$$

where x is the distance from the bridge post a to the fault; x_1 is the distance from the bridge post b to the fault, while A is the loop resistance reading on the scale; A_1 is the Varley loop reading and $2l$ is twice the distance to the tie or, if the two sides of the loop are unequal, it is the sum of the two distances.

The formula is derived as follows: The general Wheatstone bridge formula, as proved in works on physics and electricity, is $A/B = C/D$ or $AD = BC$. We may add AC to both sides without affecting the value, thus $AD + AC = BC + AC$ or $A(C + D) = C(A + B)$ or $\frac{A}{A+B} = \frac{C}{C+D}$ Since $\frac{A}{A+B}$ is a ratio, the terms may express either resistances or lengths. Referring to Fig. A_1 the formula for the loop resistance is $\frac{A}{1{,}000} = \frac{L}{L+R}$ if the slide wire has 1,000 divisions, while the formula for the Varley loop, Fig. B, is $\frac{A_1}{1{,}000} = \frac{L-X}{L+R}$. Dividing the first formula by the second, gives $\frac{A}{A_1} = \frac{L}{L-X_1}$ or $A(L-X) = LA_1$ or $X = L\frac{A-A_1}{A}$ in ohms. Multiplying both members of the equation by a factor representing feet per ohm of the loop, we obtain in feet $x = \frac{A-A_1}{A} 2l$ and since $x_1 = 2l - x$, $x_1 = 2l - \frac{A-A_1}{A} 2l = \frac{A-A+A_1}{A} 2l = \frac{A_1}{A} 2l$

If the faulty wire is connected to a, x will be a direct measurement and x_1 will be measured through the tie from post b. If the faulty wire is connected to b, x_1 will be the direct measurement and x will be measured through the tie.

An inspection of both formulas shows that if the fault is near the tie, the ratio with either formula will give about one-half, while if the fault is near the bridge, the ratio will be nearly zero for the short measure and near unity for the measurement through the tie. The latter measurement is therefore the more accurate, but it requires a little more calculation.

If the loop is made up of wires of different gages or, if one side of the loop is in a different cable from the other, as would sometimes be advisable where an entire trunk cable fails, then the calculations will save time if made as follows:

Determine A and A_1 and, by inspection, estimate the approximate location of the fault. Note the gage of wire in that region, then by means of the following table convert the lengths of the other gages in the loop, to the effective lengths if all were of that same gage. Add these effective lengths and substitute for $2l$ in the formula. This will give the effective distance to the fault, including the true distance from the beginning of the chosen gage to the fault.

	Larger					Smaller			
No. of sizes	4	3	2	1	0	1	2	3	4
Multiplier ..	0.40	0.50	0.63	0.79	1.00	1.26	1.59	2.01	2.53

For example in Fig. C with the bridge at B and the tie at T, if A_1 is nearly equal to zero or A, reduce all cable to No. 18, but if A_1 is about half of A, then reduce all cable to No. 22 gage, while if the values are intermediate, reduce all to No. 19 thus:

No. 22	300× 0.5= 150
No. 19	2,000× 1=2,000
No. 18	200×1.25= 250
Total effective No. 19 one side.....	2,400
	2
Total effective No. 19 both sides.....	4,800
If $x_1 = .8 \times 2l$, x_1 will be.....	3,840
Half of loop.....	2,400
Distance from T.....	1,440
No. 22 gage cable.....	150
Distance from C.....	1,290

or since $x_1 = .8 \times 2l$, $x = .2 \times 2l$ either by subtraction or measurement, then

	x = 960
No. 19 gage cable.....	= 250
Distance from D.....	= 710

By using a slide rule for the calculations, the location of the fault is determined almost as soon as the readings of A and A_1 are made, if the length of cable has already been ascertained.

The general Varley formula in terms of distances is: $x = \frac{B_2 A_1 R_1 - B_1 A_2 R_2}{(A_2 + B_2) A_1 R_1} 2l$ where A_1 B_1 R_1 are the ratio and resistance arms for the loop resistance while A_2 B_2 R_2 are the corresponding values for the Varley loop.

If B is constant for both measurements, $x = \frac{B(A_1 R_1 - A_2 R_2)}{(A_2 + B) A_1 R_1} 2l$ or if A and B are both constant, $x = \frac{B}{A+B} \frac{(R_1 - R_2)}{R_1} 2l$, either of which is convenient with the box type of bridge.

If R is constant, the slide wire formula given above is obtained when 1,000-A is substituted for B in each measurement.

Pittsburgh, Pa. Paul F. Shuey.

Co-operation with Branch Exchange Operators.

In an endeavor to increase the efficiency of branch exchange telephone operators the New York Telephone Co. held a series of receptions at Rochester and Buffalo with private branch exchange attendants in those cities as guests. In

Rochester there are 125 branch exchanges with 160 attendants. In response to the letters of invitation to the latter, 180 were present at the lecture, many of the attendants having brought friends. In Buffalo it was necessary to hold meetings on three evenings because of the large number of private branch exchange attendants in the city. Buffalo has 389 private exchanges and 420 attendants. In the three meetings about 390 attendants were present.

At each meeting an official of the traffic department gave a talk on the work of the private branch exchange attendant, following which a talk was given by Miss Ida Warner, formerly an operator at the Tupper exchange, who was transferred to the operators' school about a year ago. In the latter position she has given special instruction in properly enunciating the words and phrases used by operators.

The meetings in both Rochester and Buffalo were attended by the chief operators of the various central offices, who took the opportunity to become better acquainted with the private branch exchange attendants. After the talks the guests were entertained with motion pictures and refreshments were served.

Miss Warner's address at Rochester, which gives an interesting insight into the co-operation sought between the central and the private branch exchange operators, is published in the Telephone Review. After a graceful opening she said in part:

"More than the spirit of co-operation is required if private branch exchange operating is to justify itself as a profession indispensable to the up-to-date business concern. There must be the motive force of efficiency. Rochester has 125 private branch exchanges with 2,041 extension stations bound to the central offices of the New York Telephone Co. by 823 central office trunk lines. Consider the great volume of traffic that passes between these stations and over these trunk lines and you will realize the great aggregate saving in time and the consequent quickening of the heart beat of Rochester's business interests if you save a few seconds on each connection by specializing and perfecting the methods of operation.

"You may fail to speak directly into the transmitter, making a repetition of the call necessary; or perhaps you may fail to let the operator know that her acknowledgment of your number is incorrect, in which case a wrong connection may be established. Some of you are not announcing the name of your concern when answering incoming calls. How much better it is for you to answer "Smith, Brown & Co." or 'Main 1-2-3,' preferably the former, instead of 'Hello.' The calling party at once knows he has the right number, and he does not have to make unnecessary inquiries. You have opened for him the door which he is trying to enter in order to transact business with your employer. In answering an extension, say 'Number, please?' When making an outgoing call use your 'non-listed' trunks or the higher numbers of your listed series so that your lower listed numbers will remain available for incoming calls. The central office operator, on a call for the smaller private branch exchanges, tests the listed lines from the lowest number up, until a line not busy is found. If, for your outward calls, you use the highest listed number not in use, the number of lines which the central office operator must test is reduced to a minimum. It is like efficient train despatching. The talk trains which you start take certain tracks, and the talk trains inward bound to you have a clear right of way.

"Your work is not confined to handling cords and plugs efficiently. Your field is much larger. One of the great difficulties that the telephone company encounters in its endeavor to give a high grade of service is that of conveying to telephone users an adequate conception of its methods of operation. It is practically the same with you. Your difficulties will be greatly reduced if you educate your extension users to pass all calls by number and to stay at the telephone until the connection is established or a definite report is given."

Guying—Insulation on Joint Use Poles.

Whenever a pole line is to be used jointly with electric light or power companies, all existing guys together with any new guys should be insulated by the insertion of one or more strain insulators as conditions may require, says a writer in The Telephone Bulletin.

Every guy should have at least one strain insulator inserted in it at a point between six and eight feet in a horizontal distance from the pole, provided always that the insulator when so located is not less than eight feet above the ground. In case the guy is too short to permit of the strain insulator being inserted at a point six to eight feet from the pole, and at the same time have the insulator eight feet above the ground, the strain insulator should be inserted eight feet in a vertical distance from the ground, regardless of the distance it may bring it from the pole.

Side guys, unless they are attached to a conducting support or are exposed to possible contact with electric light or power wires other than those carried on the guyed pole, should be equipped with but one strain insulator as mentioned above.

To be strictly in accord with standard practice, a second strain insulator is required in every guy which comes within the following classes:

1. Head guys, run from one pole to the next pole on the line.

2. Exposed guys, viz., guys which pass over, or under, or are in any way exposed to possible contact with electric light or power wires other than those carried upon the guyed pole.

3. Anchor guys.

4. Guys which are attached to a conducting support, such as a rock, iron bridge, or other metallic or conducting objet.

5. Guys which are attached to a house or other building structure.

Wherever the second strain insulator is required, it should be placed at a point between six and eight feet from the object to which it is attached, whether it be stub, tree, rock, structure, anchor or other object, provided always that the insulator so located is not less than eight feet above the ground. In case the second insulator, if placed six feet from the object, is less than eight feet from the ground, then the insulation should be placed eight feet in a vertical position from the ground regardless of the distance it is from the object to which it is attached.

In the case of short guys, where two strain insulators may be required and they should happen to come at the same point or near each other, it is permissible to have two insulators coupled in series.

It is desirable to have all guys, unless they are anchor guys, attached to non-conducting supports and to be located not nearer than eight feet from the ground.

All guys should clear the crown of the highway by at least 18 feet. On principal highways, where vehicles of the auto-bus type are used to carry passengers, the clearance should be not less than 200 feet.

Wherever a guy passes under or over an electric light or power wire, it should be so placed as to provide at all times a clearance of not less than two feet between the guy and said electric light or power wire.

Too much attention cannot be paid to the mechanical features of guying as the rigidity of the line will depend upon the strength of the guys used and security of the supports to which they are attached.

A German Military Telephone and Its Hiding Place.

Looking out of the windows of a German military train when it stopped at Charleroi one morning, says James O'Donnell Bennett, European war correspondent for the Chi-

cago Tribune, I saw a German soldier bending over a flower bed in the grounds of the railway station. He seemed to be attentively examining the flowers. As he knelt there he frequently moved his hands gently among the blossoms as if he were caressing them.

"See," I said to one of my companions, "there is that beautiful German love of flowers again. With the ruins of whole streets of this town still smoking this private soldier finds time to admire a flower bed that has escaped destruction."

We grew quite sentimental about the matter.

Suddenly the man rose from his knees and with him there came from the flower bed a telephone receiver and two or three yards of telephone wire. Straightening himself, he put the receiver to his ear and spoke rapidly. We could hear some of the words. They appeared to be a repetition or verification of certain orders.

The flower bed and the soldier were on the left of our train.

On the right, and at a greater distance, you saw two parallel streets of unroofed houses. From their cellars and shattered floors clouds of smoke rose lazily into the sunshine. As the train was pulling out with its burden of silent German wounded, or disconsolate French and English prisoners, and of fretted correspondents who had been suavely assured that they were "guests" of the German army, the soldier ceased speaking and deftly replaced the telephone receiver and the wire among the flowers.

Lines from a Minnesota Lineman.

By Well Clay.

WEATHER REPORT.

Shrouded was the light of morning
With the chilling mists of autumn;
Drifted sullen clouds of moisture
Ghostlike through the naked branches;
Branches dripping as with tear drops
For the fading of the summer,
For the leaves now fallen from them
Damp and sodden to the dark mould;
Moved no beast, nor bird, nor insect,
Came no sound but ceaseless dripping
And the lapping of the wavelets
On the lone beach at the shore.

Thus did nature weep for summer
For the thoughts of cruel winter,
Winter with his rude caresses;
With his icy breath which withered
All of summer's tender blossoms;
Changed to white her soft green carpet;
Locked with ice the lakes and rivers;
Drove the birds on swift wing southward
At his coming close to woo her,
Soon to clasp her in his bosom.

When days like the foregoing come, we feel right glad to know, as we wander down to the warehouse in the morning, that the line patroling is well done for the season and that the only thing which can take us out on stormy days, is an accident to the lines. If we have renewed all the batteries in the rural telephones, and given each a careful inspection, we may feel we can now turn our attention to things closer home for awhile, and try to solve some of the problems which come up from day to day, like the story which my father used to tell about the time he and a number of other men made a Southern excursion many years ago on the invitation of the government.

The object of the excursion was not for the pleasure and polish which ordinarily comes from travel, but was for the purpose of paralleling the lines, so to speak, of the Southern Confederacy, which they did with so much success, on one occasion, that the lines merged, as it were; and when my father and his other fellow travelers registered for the night, they found that they were to be assigned rooms in that now famous hostelry, Libby Prison. One of the items on the bill of fare, which subsequently proved to be pea soup, turned up very frequently and was not, to say the least, a dish which a well fed man would go many miles to partake of—that is, the second time.

On his first introduction to the dish, my father noticed that the top layer of the soup was quite thickly covered with bugs of some sort, evidently some parasite of the pea. Not having, as yet, become accustomed to bugs as an article of diet, he secretly skimmed them off, throwing them aside quietly so that the hotel management would not feel hurt, as they might, should they notice his action. Upon resuming his feast, he noticed to his amazement that another layer of bugs was just below; and as he was not so hungry anyhow, he skimmed this layer off, only to uncover another. He kept on until he reached the bottom of the dish, by which time he was becoming dissatisfied with the place and was ready to leave.

That seems to some of us, at times, the way the telephone business is. We only get one bunch of trouble fixed up, when another begins to act quite prominent; and when we get that settled and start for some easy corner in which to rest and pride outselves on what we have accomplished, we fall over a few more. But then the telephone business is not all gloom, and at times we do have lots of fun.

But to get back to my subject before I get the flag: This time of the year is a good time to get the warehouse in shape for invoice taking and for cleaning up generally for the end of the year.

One should cut up and box ready for shipment when the market seems right, all the old brass and copper junk that he can scrape up. Then he should take the axe to a lot of old back number instruments and add their vital remains to the rest of the junk because, even if you do get a patron to stand for the installation of one of them, it does not pay, as you have to visit them too often to keep them in serviceable shape.

One should also take an invoice of his poles on hand and perhaps figure out the needs of the following spring, so that he can write for prices through the winter, or maybe be ready to place an order with the pole men at the association meetings. They are glad to book them for future delivery.

One could also use up any old lumber in making a wire rack on stormy days, if you don't have one. One of the best I have seen is an inexpensive one made by friend J. M. Storkerson, superintendent of the La Crosse Telephone Co. of La Crosse, Wis. He would send anyone wishing it, a copy of the specifications, I am sure, because he is a good fellow and has the best thing in that line which I have come across.

Clean off all your shovels and other tools, also, if you should find some with dirt on them. A good plan is to precede your invoice with an advertisement in your local paper, asking all those people who have borrowed tools of the telephone company during the summer, to bring them in for the invoice and incidentally to leave them with you until they feel their need again.

Make a few plans now for next year, not only as to the work you will do, but how you will do it. Go over the motions you will have to make in your mind and see if you can think a job out clear through. Keep a record of the materials you will need for the certain work in hand. Then let some good friend, who knows the game, go over the specifications and see how near 100 per cent. you can get.

In my next letter I am going to enclose a copy of the specifications and a drawing of our tool and supply box. I want every one to go over it and see how much you can beat it for cost, economy and space, convenience and adaptability to the needs of a lineman or repairman.

Plans for Future Operation of Chicago Automatic System

City Telephone Bureau Presents Plans to City Council Looking to Future Operation of Automatic System—Provision Made for Establishing an Interchange of Service with Bell Telephones—Details of Interchange Scheme to Show Feasibility

At a recent meeting of the council committee on gas, oil and electric light of the city of Chicago, the city telephone bureau presented plans looking to the future operation of the automatic system in the event that the council permits the sale to the Chicago Telephone Co. or that the system is declared forfeited to the city. These plans were drawn up by the telephone bureau upon the request of Montague Ferry, commissioner of public service.

Four plans were presented to the city officials for investigation as to their feasibility. The first plan assumes that the automatic telephone system of the Illinois Telephone & Telegraph Co. is forfeited to the city on account of claims that the terms of the franchise were not fully carried out. It provides for the leasing of the system to a company showing the proper financial responsibility, on the condition that the leasing company assume the bonded indebtedness on standing and also that it build, operate and maintain a sufficient number of interconnecting or semi-automatic exchanges to accommodate interchange service between the automatic system and that of the Chicago Telephone Co. It further provides that the city shall have direct supervision over all of the activities of the leasing company. The plan allows the Chicago Telephone Co. to charge for all calls originating at an automatic subscriber's station and connected to a manual subscriber's station. Interchange calls, originating at stations of the Chicago Telephone Co.'s system, shall be handled without additional expense to the originating subscriber other than that charged under existing contract, The Chicago Telephone Co. is to pay to the interconnecting company 50 per cent. of the gross revenue derived from the measured service calls originated by the automatic subscribers and completed to manual subscribers.

Plan No. 2 makes the same stipulations as plan No. 1, excepting that the Chicago Telephone Co. may be the leasing company.

Plan No. 3 provides that the city take over the automatic system and operate interconnecting exchanges, the Chicago Telephone Co. to pay to the city 50 per cent. of the gross income derived from calls originating on the automatic telephones and completed to Bell telephones.

Plan No. 4 permits the Chicago Telephone Co. to purchase the automatic system at its present value, on condition that it install, maintain and operate an interconnecting system and furnish service to automatic subscribers within the district now supplied by the automatic system. It also provides that the Chicago Telephone Co. be permitted to charge for interconnecting calls originating from automatic instruments on a measured service basis until the purchase price has been wiped out, after which it is to furnish automatic service and interconnection at the lowest possible price, considering the cost of the service.

In a report drawn up by Arthur Kneisel, assistant city telephone supervisor, the arguments for plan No. 1 are given in detail, the figures being given for but one interconnecting exchange. It is suggested that an interconnecting exchange be established in the Manhattan building, in which the Harrison office of the Chicago Telephone Co. is now located. This exchange, it is stated, is to be vacated in the near future. A method for handling interchange business is outlined and affidavits are presented showing that interconnection between the automatic and manual systems is feasible.

In the plan outlined by Mr. Kneisel, the following arguments and figures are presented to show the feasibility of the interchange plan.

The failure of the Tunnel company to secure and retain a sufficient number of subscribers has undoubtedly been due to a great extent to the lack of confidence and faith on the part of the public in the Illinois Tunnel Co. or the Illinois Telephone & Telegraph Co. Interconnection would do more to establish this necessary confidence than any one other move that might be made. The value of this public confidence might be said to amount to the difference between the scrap value of the plant and its going value. This, the proposed plan intends to put into useful, tangible assets.

The attorneys for the Tunnel company have stated that the present automatic system could be increased to serve 70,000 subscribers in the present territory with but small additional expense. The cables of this company have been permitted to deteriorate to a considerable extent, therefore some money would be required to rehabilitate the plant.

Assuming that $200,000 are required to put the plant in good shape and that $300,000 are required to install three interconnecting exchanges and the necessary trunk cables, this surely cannot be called an excessive capital required to prevent such an enormous waste as the junking of such a valuable property would cause. It may safely be assumed that, backed by public confidence, the automatic system will pay satisfactory dividends on the investment, as was estimated in the original engineering of the proposition. As the territory is to remain the same, the securing of additional capital for the extension does not affect the discussion; so the financing of the interconnecting offices is the only problem requiring consideration.

The Department of Public Service does not pretend to have solved all the phases of the situation, and the following figures are based in many cases upon assumptions. They are close enough to be indicative that interconnection will yield very liberal dividends.

Automatic exchange office No. 6, known as Plymouth office, has a capacity of approximately 5,000 straight line, 500 two-party and 500 four-party line subscribers. Assuming that each line will make an average of 10 incoming calls per day, or 60,000 "in" calls (handled by interconnecting operators), figuring an 8-hour day, there would be 7,500 calls during the peak load, 500 calls per operator during the peak load (a conservative estimate for semi-automatic work), and it would require 15 operators to care for the peak load. Allowing 5 additional operators for relief and to afford proper time distribution, this would total 20 semi-automatic operators to care for 6,000 lines of Plymouth office:

20 operators at $60 per month	$1,200
1 chief operator at $80 per month	80
1 assistant chief operator at $70 per month	70
	$1,350
	12
	2,700
	1,350
Annual operating expense	$16,200
3 switchboard men at $1,440 per year	4,320
	$20,520

or approximately $20,000 per annum for operating and switchboard repair salary account.

Cost of Semi-Automatic Equipment.

16 positions at $800 per position	$12,800
Installing	3,200
	$16,000
Trunk cabling	24,000
Semi-automatic investment	$40,000

Assuming that 8,000 sq. ft. of floor space are required for all apparatus, lunchrooms, and locker rooms, to install semi-automatic board to serve Plymouth exchange, with rent about $1 per sq. ft. per year, the carrying charges would be:

Tax and insurance 2 per cent. of $40,000	$ 800
10 per cent. depreciation	4,000
6 per cent. interest	2,400
Salaries	20,000
Maintenance material, 2 per cent	800
Light, heat and power	800
Rent	8,000
Overhead 20 per cent	7,360
Carrying charge	$44,160

INCOME.

5,000 subscribers (circuits) at $81 per year	$405,000
500 (2-party) subscribers at $102	51,000
500 (4-party) subscribers at $144	72,000
Total	$528,000

or income on flat rate service which is to care for the carrying charges on the automatic system which should include the bonded indebtedness, assuming that each line will originate 5 calls per day which are to terminate on manual Bell lines.

6,000 lines × 5 equals..... 30,000 calls per day.
30,000 × 300 days equals.....9,000,000 calls per year.
Estimating these at 4 cents each .04

$360,000

income on measured service of 6,000 lines; 50 per cent. of this to go to interconnecting company.

Fifty per cent. of $360,000 equals $180,000 per annum available, for a carrying charge of $45,000. This would leave $135,000 net on an investment of $40,000. No mention is made here of the possible commission on toll and long distance calls originating on automatic telephones.

Attention is called to the fact that on all the measured service calls originating on the automatic system, the Bell company would have no subscriber's station apparatus to maintain. It needs only additional switchboard equipment of the same kind it now uses and not much of that.

The net income would be on the interconnecting business of one automatic exchange and could, on a rough estimate, be considered one-sixth of that possible from the entire system. These figures are all conservative and more detailed engineering study would show this a better investment than here claimed.

RECAPITULATION.

What the Department of Public Service has endeavored to show by this plan, is that to permit the sale of the automatic system to the Bell company and its consequent dismantling, would not only wipe out a property which is in itself valuable, but which has enormous potential value. By this plan the bondholders will eventually be repaid all the money they invested, and the Chicago Telephone Co. will lose nothing, but will be paid for each and every interconnection made. The telephone public, it is true, will pay the bondholders, but they will receive the same value for their money as they do at present, and when the indebtedness has been wiped out, they can get a reduction in rates and need not continue to pay dividends on something which does not exist. The leasing company should be able to pay liberal dividends on the income from interconnection and from flat rate service. Thus, nothing is taken from any one and all interested have an opportunity to reap benefits.

District Managers of Southwestern Company Meet.

District managers of the northeast and northwest divisions of the Southwestern Telegraph & Telephone Co. met in Fort Worth, Tex., recently to discuss a proposed new system of accounting, collections, methods, facilities and other affairs of the company. J. F. Henderson, with headquarters at Fort Worth, is division commercial superintendent of the northwest division and W. C. Haas of Dallas is superintendent for the Northeast division.

Meeting of Texas Local Telephone Owners.

The Local Telephone Owners' Association of Texas held its annual meeting in Fort Worth, December 17, and elected these officers: President, C. L. Alderman, of Big Spring; vice-presidents, John I. Rust, of San Angelo, P. H. Hughes, of Palestine, J. A. Combs, of Haskell, and W. H. Crouse, of Stephenville; secretary-treasurer, Stanberg Alderman, Big Spring. The 34 telephone owners in attendance were the guests of the Western Telephone Co., of Big Spring, at luncheon at the Westbrook Hotel, where the meeting of the association was held.

Proposed legislation affecting the telephone business was discussed and an extended address on the liability of employers under the workmen's compensation act was delivered by Homer Mitchell of the state insurance association.

Program for the Kansas Telephone Convention.

The annual convention of the Kansas Independent Telephone Association, to be held at the National Hotel, in Topeka, January 5, 6 and 7, promises to be the best telephone convention ever held in the state of Kansas. The program will be filled with subjects which vitally concern every telephone man and the association invites every Independent telephone man in Kansas to attend the convention and bring his linemen and operators. The entire seventh floor of the hotel has been reserved for manufacturers' exhibits.

Fred Coulson, secretary of the association, announces the following program, which, the association believes, will be the strongest program ever presented at its conventions:

TUESDAY MORNING SESSION.

Registration—Renewing acquaintances.

TUESDAY AFTERNOON SESSION.

Address of welcome: J. Will Kelley, secretary of the Commercial Club, of Topeka.

Response, C. J. Myers, of Kansas City.

Report of secretary.

Appointment of committees.

"The Kansas Public Utilities Act," E. H. Hogueland, ex-secretary of the Kansas Public Utilities Commission.

"Connections," G. M. Stratton, of Clay Center.

EVENING.

Theatre party—Guests of Topeka Commercial Club.

WEDNESDAY MORNING SESSION.

Address, Arthur Capper, governor-elect of Kansas.

"The Financial Side of the Telephone Business." J. C. Kelsey, financial editor of TELEPHONY.

WEDNESDAY AFTERNOON SESSION.

"The Telephone," John M. Kinkel, member of the Kansas Public Utilities Commission.

"Taxation," Samuel T. Howe, member of the Kansas State Tax Commission.

Address, F. B. MacKinnon, secretary, National Independent Telephone Association.

THURSDAY MORNING SESSION.

"Valuations of Telephone Property," Herman C. Henrici, of Kansas City.

"The Value of Publicity," W. R. Kercher.

Elections of officers.

Adjournment.

At the Wednesday morning session, a photograph of the convention will be taken. At 8 p. m. Wednesday evening, the Topeka Commercial Club will entertain the guests at its club rooms.

Illinois Independent Telephone Convention in February.

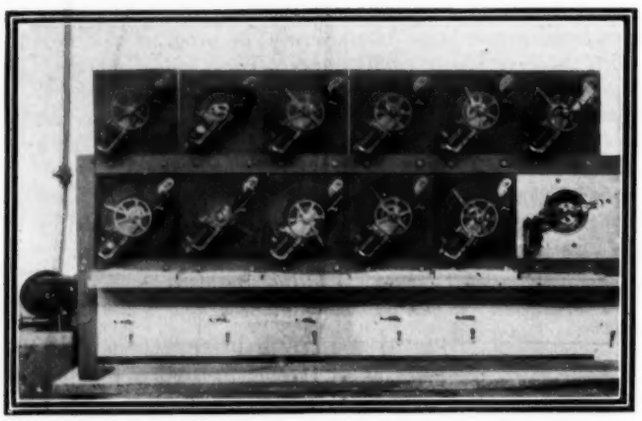
B. F. Baker, secretary of the Illinois Independent Telephone Association, announces that the annual convention of the association will be held on February 16, 17 and 18, at the Leland Hotel, Springfield, Ill. This was decided upon at a meeting of the executive committee held in Peoria, December 16. The association is planning to make this convention as interesting and important a convention as that held last year, and is looking forward to a good attendance.

From Factory and Salesroom

Conventions: Kansas, Topeka, Jan. 5, 6, 7; Independent Telephone Association, Minneapolis, Minn., Jan. 19, 20, 21; Northwestern Cedarmen, Minneapolis, Jan. 26, 27; National Independent Telephone Association, Chicago, Feb. 3, 4, 5; Wisconsin, Madison, Feb. 10, 11, 12; Illinois, Springfield, Feb. 16, 17, 18.

Determination of Materials for Switch of Corwin System.

A visit to the manufacturing plant of the Frank B. Cook Co., at Zion City, Ill., reveals many interesting matters. Probably the most interesting is the testing department, where tests are being made of the switches to be used in connection



Corwin Switch Test Panel in Cook Factory.

with the Corwin semi-automatic system which the company is placing on the market.

These switches are mounted upon a panel and supplied with battery to operate them continuously. From time to time the switches are inspected and the wear of the various parts determined. The material in the parts of the switch such as the armature fulcrum pin and bearings, ratchet wheel, pawl and pawl stop, wipers and contacts has been changed at the end of each test so that the best material for the purpose could be determined. While the common metals were first used, bronze, steel and hardened steel and finally tool steel, oil hardened, were tried in turn for the different parts comprising the switch. Various combinations of different materials were tested and thus the materials of which the parts are to be made decided upon. The tests on the switches were in some cases continuous and in other cases, intermittent, so as to approximate the conditions of actual service. The switches were operated a sufficient length of time to determine the suitability of the various parts for the function which they perform.

This careful selection of materials should insure that the switches used in the Corwin equipment will stand up well under the wear and tear of actual service.

Book Review.

AUTOMATIC TELEPHONY; by Arthur Bessey Smith and Wilson Lee Campell. Published by McGraw-Hill Book Co., New York; 397 pages with 270 illustrations, price $4.

For some time there has been a demand for a book relating exclusively to automatic and semi-automatic telephone systems which would give the methods of operation, the circuits and description of the apparatus. The authors of this book, which is the first to appear on the subject, are well qualified for the work, having been engaged for years in the automatic field. They are recognized as authorities in matters pertaining to automatic telephony and have presented a number of papers relating to its various phases, before engineering societies.

No effort has been made to treat the subject from a chronological standpoint. The principal systems in service at the present time are described and illustrated by very carefully drawn circuit diagrams, detailed descriptions being given. The principles underlying the various systems are clearly brought out, although in one or two cases the circuits shown are not the latest standard of practice in their particular classification.

The authors frankly state that, owing to the necessity of keeping the subject matter within reasonable limits, they have found it impracticable to narrate the full details of the practice of all the manufacturers. They therefore have described fully, typical circuits and apparatus of each of the more important or instructive types on the market. They found it necessary, however, to confine their discussion of such subjects as traffic, development studies, central office building design, long distance lines equipment, etc., to the practice of some one manufacturer. Wherever this has been found necessary, the practice of the Automatic Electric Co. has been followed, as the authors feel that the principles and methods brought out in those chapters are sufficiently applicable to other makes of equipment, to supply the wants of students of the general art. On this basis it is easy to understand the prominence accorded to the product of the Automatic Electric Co.

The chapter on trunking is very clear and well illustrated It will be found very helpful in acquiring an initial understanding of one of the most marked characteristics of automatic telephone switching, while the chapter on automatic district stations touches upon a development, possible only to automatic telephone systems, of the greatest importance from an operating standpoint.

Brief chapters are devoted to the discussion of traffic, development studies, cut-overs, interconnection of exchanges, measured service, and suburban and toll arrangements. The subscribers' station apparatus and auxiliary equipment for maintenance, testing, and supervision to conform to the practice of the Automatic Electric Co., is carefully described.

The volume is a valuable addition to the scant bibliography of automatic telephony. It affords a means by which the engineer in general practice may obtain a clear idea of the present trend in telephone engineering, while it will be highly prized by telephone engineers and operating staffs as a book of reference.

Paragraphs.

R. S. MUELLER, 423 High Ave., S. E., Cleveland, Ohio, manufacturers' agent and warehouseman, has issued his monthly stock sheet of magnet wire. A copy of this stock sheet will be furnished upon request.

THE STROMBERG-CARLSON TELEPHONE MFG. CO., of Rochester, N. Y., is sending out its new price lists to the trade; also circulars describing the code No. 896 compact type magneto telephone, and the 7-B type combination telephone.

THE M. W. DUNTON CO., of Providence, R. I., reports that its solderkit, which was described in TELEPHONY of October 31, is meeting with great favor. The company states that over 500 orders have been received, a great many of them going to telephone companies.

B. A. PARSONS, Dakota representative and A. J. CARTER, sales manager, of the Kellogg Switchboard & Supply Co., were in charge of the Kellogg exhibit at the convention of the South

Dakota Independent Telephone Association, held at Sioux Falls last week. The exhibit included the company's large telephone exhibit panels, apparatus parts, a magneto switchboard, pole changers and special equipment.

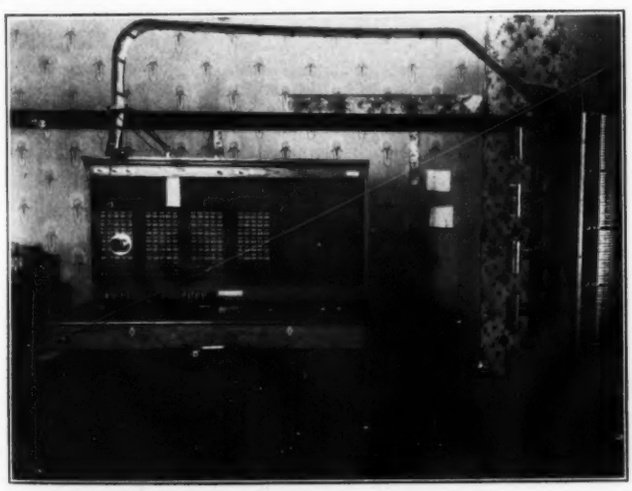
The Telephone a Useful Factor in Securing Employment.

The telephone is being used to good advantage in Nashville, Tenn., in a city-wide campaign to secure employment for the unemployed who are more numerous at this time than has been the case for many years. Five men, working by relays, are engaged in a telephone booth in the central station in calling every number on the list, explaining the purpose of the call and asking the following questions: "Can you not arrange to provide work of any kind at this time for one or more persons?" Temporary positions have been found by this means for a large number of unemployed persons and the campaign was to be continued until the town had been systematically combed for work. The first day brought large results, and work being greatly facilitated by the extensive publicity that has been given the campaign.

Stromberg-Carlson Equipment in Bedford, Ia.

A view of a recent installation of central office equipment made by the Farmers Mutual Telephone Co., of Bedford, Iowa, is shown in the accompanying illustration. This company is a solid aggregation of farmers and business men. When they recently decided to replace their old switchboard and arrester equipment, they used their telephone experience in both buying and installing the equipment The switchboard was furnished by the Stromberg-Carlson Telephone Mfg. Co. and is a type A-5631 two-position 300-line capacity board equipped with the No. 11 plug restoring drop, double clearing out circuits, code night alarm and all the latest refinements. The main frame is a standard Cook type L, equipped with No. 10 heat coil protectors.

In making this installation, the line cables were carried overhead from the switchboard to the main frame on a neat iron rack which was furnished with the switchboard by the Stromberg company. This method of overhead cabling is said to prevent the occurrence of much trouble and is more sightly than the old method of running the cables, power wires and battery wires from the arrester rack, pole changer and battery cupboard. The power and battery wires are



Switchboard Equipment at Bedford, Ia.

carried in a neat cable along the wall from the pole changer and battery cupboard, which is seen in the extreme left of the picture.

The photograph for the accompanying illustration was taken shortly after the installation and before the repairs to the wall paper, incident to the removal of the old equipment, were made.

L. W. Corder is secretary of the company and Carl Hamilton keeps the lines going.

A Submarine Telephone Test in Philadelphia Theater.

Telephoning from the bottom of a glass tank containing 7,000 gallons of water, at the Grand Opera House in Philadelphia, a reporter for The Press, of that city, recently talked for 10 minutes with his city editor, thus testing a submarine telephone invented by Captain Louis Sorcho, world's champion deep sea diver, who is playing a vaudeville engagement in which his invention is featured.

During the week considerable discussion had been raised as to the genuineness of the submarine telephone, with the result that Manager Smith, of the theater, extended an invitation to the newspapers to test the validity of Captain Sorcho's claims. A reporter was detailed to make a descent, and put the submarine telephone to every test.

Before a committee, composed of newspaper men and naval officers, the diving dress was placed on the reporter, the apparatus connected and the test began. Immediately on the reporter reaching the bottom of the tank, a switch was thrown over and the reporter asked central to connect with the editorial department of The Press. For fully ten minutes the reporter talked with his city editor, every word being heard as clearly and distinctly as if he were using the ordinary telephone.

Both committee and press were satisfied that the captain had invented not only a very practical submarine telephone, but a device that will, if adopted by the United States government, prove a valuable asset to the navy.

The greatest danger encountered by men following the profession of deep sea diving lies in the means of communication between themselves and those above, and this consists in merely a small rope called the life line. Once that breaks or becomes fouled, the chances for a diver's life are reduced to a minimum. Captain Sorcho, himself, has had several narrow escapes from death through the life line becoming entangled, and hence his invention of the deep sea telephone.

A Long Distance Message.

Perhaps no more surprising telephone message was ever delivered than a recent message received by John Barrett, director of the Pan-American Union at Washington, D. C. A few days after war was declared in Europe, his telephone bell rang and when he put the receiver to his ear a voice said: "I am the Minister of Foreign Affairs of the Argentine Republic in Buenos Aires. I desire some information which I desire to use this afternoon in a speech to the Argentine congress."

Within 15 minutes Mr. Barrett had obtained the data and was talking it into the telephone. Less than two hours later it was incorporated in a speech made before the Argentine congress.

The message, of course, came by telephone only from New York. The message was written, however, in the first person, was telegraphed across the Andes from Buenos Aires, Argentina, to Valparaiso, Chile; then it was sent under the ocean by cable to Panama. It was then telegraphed to a station on the Isthmus of Tehuantepec, relayed across Mexico and then cabled to Galveston. From Galveston it was telegraphed by direct wire to New York and then relayed by long distance telephone to Mr. Barrett's desk in Washington.

The return message traversed the same route in the reverse direction and the total time required by the exchange, including the necessary time it required for Mr. Barrett to look up the data asked for, was one hour and a half. The distance from Buenos Aires to Washington is 7,500 miles.

Record of Telephone Patents Recently Issued

1,117,156. November 17, 1914. SECRET TELEPHONE EXCHANGE; R. M. Beard, New York. The feature of this patent is the provision of operators' listening keys so arranged as to connect the operator's set to any one of the subscriber's lines and at the same time to disconnect the operator's set from any other connection previously established, so that the operator can listen in at but one subscriber's line at a time.

1,117,211. November 17, 1914. LINEMAN'S CHAIR; F. W. Mayes, Hopkinsville, Ky. The provision of a roller over which the cable passes thus rendering accidental displacement of the chair from the messenger strand negligible, is the feature of this chair.

1,117,212. November 17, 1914. AUTOMATIC TELEPHONE EXCHANGE APPARATUS; F. R. McBerty, New Rochelle, N. Y.; assigned to Western Electric Co. A test circuit for automatic exchanges is described. It includes a marginal test relay, a polarized test relay and circuits adapted to be completed in the contacts of the test relays to determine in accordance with the conditions of the engaged test terminals, whether the sequence switch shal remain in testing position or go either to the ringing or busy back position.

1,117,215. November 17, 1914. TELEPHONE TOLL DEVICE AND CIRCUITS THEREFOR; J. L. McQuarrie, Montclair, N. J.; assigned to Western Electric Co. This toll device is designed to provide a reliable system for charging the number of successful calls. It consists in the combination of an electromagnetically controlled step by step advanced service meter which acts to set in motion signal transmitting means whereby signals are given over a predetermined number of steps.

1,117,231. November 17, 1914. LOUD SPEAKING TRANSMITTER; J. C. R. Palmer, Brooklyn, N. Y., and A. E. Pinkler, Weehawken, N. J.; assigned to Western Electric Co. Upon a sound receiving diaphragm, a granule containing cup is mounted. A pair of stationary electrodes is located in opposite ends of the cup and a second pair disposed, back to back, mounted centrally in the cup to vibrate therewith. A resistance bearing medium is placed between the stationary electrodes and the centrally mounted vibratory electrodes.

1,117,290. November 17, 1914. SEMI-AUTOMATIC TELEPHONE SYSTEM; A. H. Weiss, Chicago; assigned to Kellogg Switchboard & Supply Co. In this system a supervisory relay and a connector switch are provided for each cord circuit. The actuation of any line relay is adapted to set an idle connector switch into operation and to cause its contacts to move to the contacts associated with the calling line. A circuit, including the cut-off relay of the line and the supervisory relay of the called circuit, is completed through the contacts of the selector switch for interrupting the circuit of the line relay, and contacts in the supervisory relay, interrupted responsive to its energization, interrupt the movement of the connector switch.

1,117,293. November 17, 1914. INDUCTION COIL; D. H. Wilson, Chicago; assigned to D. H. Wilson and R. Bines, trustees, New York. An octapole induction pole is described. It is comprised of a rectangular core having three primary coils and three secondary coils wound on one side and three primary and three secondary coils wound on the opposite side. The portions of the core between the coils are magnetically separated, but mechanically connected.

1,117,296. November 17, 1914. IMPULSE TRANSMITTER; J. A. Wotton, Montclair, N. J.; assigned to Western Electric Co. Clockwork mechanism, including make and break devices operated by a motor-driven shaft, is described. Contact springs are adapted to be engaged by the teeth of the wheel for making and breaking a circuit. An adjustable member determines the number of teeth on the wheel effective for signaling purposes.

1,117,297. November 17, 1914. TELEPHONE EXCHANGE SYSTEM; J. L. Wright, Washington, D. C.; assigned to F. C. Stevens, Attica, N. Y. A full automatic system is described. It has a testing switch between the first and second selector switches and between the second selector and connector switches by means of which the double selective motion of the switch is designed to be eliminated.

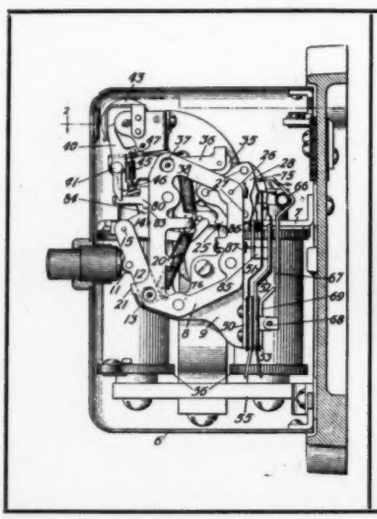
1,117,407. November 17, 1914. TELEPHONE SYSTEM; Edmund Land and F. L. Fisher, Grand Rapids, Mich.; assigned to F. C. Stevens, Attica, N. Y. A semi-automatic system which provides for the distribution of calls is described. A plurality of rotary Y-switches, in each of which telephone lines are connected to waiting contacts, is provided. A circuit is adapted to be closed by means of the line relay becoming energized in response to a call from a substation upon any of the telephone lines and connection is extended to the first of the Y-switches. A relay in the first switch extends the circuit to the second Y-switch when the first Y-switch has its wipers in connection with the waiting contacts of the telephone line.

1,117,485. November 17, 1914. ELECTROMAGNET; O. F. Forsberg, Yonkers, N. Y.; assigned to Western Electric Co. The electromagnet described is adapted for use in coin collector boxes. A plate is supported on the armature pivots and is movable by the armature, while a pair of spring tensioned levers, supported on the armature pivots, is adapted to gradually increase the load on the armature during its movement, thus to insure positive operation of the magnet.

1,117,486. November 17, 1914. REGISTERING MECHANISM; O. F. Forsberg, Yonkers, N. Y.; assigned to Western Electric Co. This register comprises a registering mechanism, a manually operable member, and an actuator for the mechanism, which is placed in operative position by the operable member and contacts which are controlled by the manually operable member. An electromagnetic release for the actuator is operated in the same direction, whether or not a registration is to be made. The register controlling means are operated only when a registration is to be made.

1,117,511. November 17, 1914. AUTOMATIC TRUNK SIGNALING SYSTEMS; F. R. McBerty, New Rochelle, N. Y.; assigned to Western Electric Co. A numerical indicating apparatus is described for use at manual exchanges which is responsible to automatic calling mechanism. Means are provided for automatically associating the indicating apparatus with any one of the cords, and signaling means designate to the operator with which cord the indicating apparatus is associated.

1,117,553. November 17, 1914. SELECTIVE SWITCHING AP-



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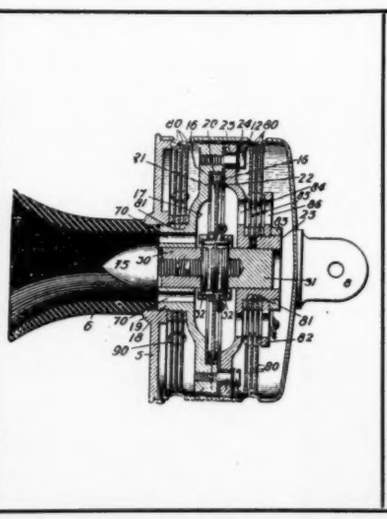

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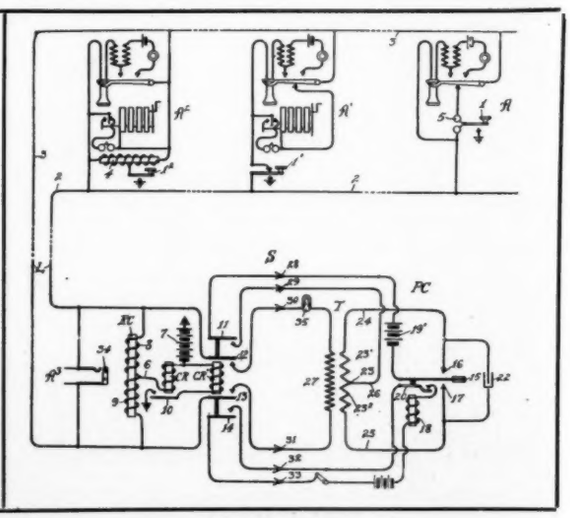


No. 1,117,832.

PARATUS; E. B. Craft, Hackensack, N. J.; assigned to Western Electric Co. This selective switching apparatus is designed for use in connection with automatic or semi-automatic systems. A number of selector switches is driven by a common power shaft and controlled by an interrupter mounted on the same shaft.

1,117,832. November 17, 1914. SIGNALING SYSTEM; H. C. Goldrick, San Francisco, Cal.; assigned to Kellogg Switchboard & Supply Co. A signaling system for party lines is described. A grounded control switch is placed at each of the substations for grounding the line and an impedance coil is permanently connected in bridge on the line. A grounded source of current is connected to a central point of the impedance coil. Means responsive to a flow of current from the grounded source over the line when one of the switches is actuated, connects a signaling current source in bridge with the line.

1,117,864. November 17, 1914. SIGNALING SYSTEM; M. E. Launbranch, Chicago; assigned to Kellogg Switchboard & Supply Co. Intermittent current is used in this signaling system for party lines. A signal receiving device is provided at each substation, as are also controlling means for controlling the operation of the source of intermittent current and its association with the circuit, to operate the signal receiving devices.

1,118,230. November 24, 1914. TELEPHONIC INSTRUMENT; G. R. Preusse, New York; assigned to Detecta Phone Co. of America. In this instrument a holder is provided having two recesses. A receiver is permanently mounted in one recess and a movable receiver in the other. Normally, these receivers are connected in parallel with a distant transmitter. Connection is so made that when one receiver is removed from the holder the other receiver is out of circuit. A switch between the transmitter and the two receivers is provided for making and breaking the circuit.

1.118,340. November 24, 1914. TRANSMITTER BRACKET; A. F. F. Gilson, Closter, N. J.; assigned to Western Electric Co. A sheet metal bracket with an adjustable lug is described. The bracket has parallel wings and a sheet metal plate having a projection on it is placed in such a position as to extend through an opening in one wing to the bracket into a recess in the transmitter lug. A screw retains the plate in position against one wall of the bracket.

1,118,490. November 24, 1914. AUTOMATIC TELEPHONE SYSTEM; D. S. Hulfish, Toronto, Ont., Can.; assigned to Canadian Independent Telephone Co., Ltd. The feature of this system is the provision of a busy tone circuit, the telephone lines being normally inductively connected to it. Means are provided for automatically disconnecting any one of the telephone lines from the tone circuit. Provision is made for guarding the line, during its connection with the trunk, from interference by any other telephone line attempting connection with the trunk.

1,118,655. November 24, 1914. CALLING DEVICE; W. Kaisling, Chicago; assigned to Kellogg Switchboard & Supply Co. A finger operated calling device for automatic telephone systems is described in this patent. The feature is a finger lever which is adapted to be actuated by engagement with the finger in a finger hole. Means released by the finger lever are provided for holding the dial locked, after the removal of the finger, when moved to any of its operating positions.

1,118,751. November 24, 1914. ATTACHMENT FOR WALL TELEPHONES; Anna S. Ellsworth, Oakes, N. D. An attachment is provided for supporting the receiver. It consists of a series of arcuate links pivotally connected at their ends to each other. All of the pivotal connections are adapted to bind the engaged parts together with sufficient pressure to hold the receiver in any position to which it may be adjusted.

1,118,780. November 24, 1914. TELEPHONE TRANSMITTER; A. D. Jones, Philadelphia. In this transmitter a resistance cell is mounted in a central cavity and rigidly connected to a body of resilient material which surrounds the cavity. A diaphragm is operatively connected to the cell and supported at its periphery on the body of the resilient material. By this construction, it is designed to prevent packing of the carbon granules.

1,118.910. November 24, 1914. AUTOMATIC TELEPHONE SYSTEM; A. Dyson, Chicago; assigned to Kellogg Switchboard & Supply Co. Relates to a method of connecting a calling line in one exchange to a two-conductor trunk circuit between exchanges of a multi-office system. A special vibratory relay is provided for extending the trunk circuit to the called line.

1,118,925. December 1, 1914. HARMONIC RINGER; John Erickson, Chicago; assigned to Automatic Electric Co. A harmonic ringer for use on party lines is described. A pair of knife edges are placed on opposite sides of the armature and intermediate of the striker and a spring which is secured to the lower portion of the armature, the striker being carried by the upper portion. The spring operates to hold the armature in place upon the stationary part upon which the knife edges rest.

1,118,926. December 1, 1914. TELEPHONE RECEIVER; John Erickson, Chicago; assigned to Automatic Electric Co. The core of this receiver is comprised of a pair of U-shaped member, each member composed of a bundle of soft iron wires having their central arms joined together and located adjacent to, but out of contact with, the middle of the diaphragm. A cup incloses the core and a pair of non-magnetic bars clamps the ends of the core to the cup.

1,119,016. December 1, 1914. RECORDING TOLL TRUNK CIRCUIT; J. E. Hilbish, La Grange, Ill.; assigned to Kellogg Switchboard & Supply Co. A call signal relay is energized when connection is made with the outgoing end of the trunk. A call signal at the incoming terminal is responsive to the energization of the call relay. Disconnect and effacing relays are adapted to be energized when connection is made with the incoming terminal, whereby the signal is effaced. When disconnection is made from the incoming terminal, the disconnect relay is de-energized to alter the effective resistance of the circuit connections extending from the outgoing terminals. The circuit is adapted to be used in connection with universal cord circuits of a marginal relay type.

1,119,083. December 1, 1914. TELEPHONE SYSTEM; B. G. Jamieson, Chicago. Means are provided at the exchange for establishing the busy and non-busy conditions of the associated circuits. A line lamp for each substation is adapted to be illuminated only when its associated circuit is not connected with a cord circuit. Means at the substation are provided for causing a bright illumination of the line lamp and also a dim illumination.

1,119,131. December 1, 1914. TELEPHONE RELAY; H. G. Webster, Chicago. A multi-contact relay is described. A series of flexible contact springs are supported by an insulated mounting rigidly related to the magnet structure. The springs collectively form a bank having overlapping relation with the magnet structure. A series of wiping contact members, movable in planes intersecting the plane of the bank, are actuated responsive to movements of the armature to electrically engage the free end of certain of the springs.

1.119,246. December 1, 1914. ELECTRIC CABLE; J. H. Cuntz, Hoboken, N. J. A method of counteracting the capacity of an electric cable is described. It consists in increasing the inductance of the cable substantially uniformly throughout its length and increasing its capacity in a lesser degree.

1,1119,301. December 1, 1914. TELEPHONE TABLE INSTRUMENT; G. B. H. Meyer, Hamburg, Germany. A tubular resilient arm is arranged in proximity to a desk telephone support. A telephone cord passes through the arm and extends a distance beyond it, the enclosed portion of the cord being adapted to be deflected conjointly with the tubular arm. The telephone receiver is secured to the protruding end of the cord.

1,119,355. December 1, 1914. TELEPHONY; M. L. Johnson, Chicago; assigned to Frank B. Cook Co. The feature of this semi-automatic system is the provision of a link connector intervening between the first switching section and the other switching section.

1,119,366. December 1, 1914. SUPPORT FOR TELEPHONE RECEIVERS; H. W. Munch, Arlington, Mass.; assigned one-half to F. C. Munch, Hull, Mass., and one-half to M. W. Springer, Cambridge, Mass. A receiver support for use in connection with a desk stand is covered by this patent. It consists of a supporting arm which sustains the receiver rest. A hook depressing lever is pivoted to the arm, the arm having fingers to embrace the desk stand so that the extension is maintained in proper position.

1,119,394. December 1, 1914. TELEPHONE SYSTEM; J. G. Blessing, Chicago; assigned to Automatic Electric Co. A subscriber's calling device for automatic systems is featured in this patent. The device is provided with an impulse wheel in the form of a cup having a continuous but uneven edge serving as a cam. Circuit controlling means, insulated from the cup, are engaged and operated by the cam edge of the wheel.

1,119,526. December 1, 1914. CALLING DEVICE; G. E. Mueller, La Grange, Ill.; assigned to Kellogg Switchboard & Supply Co. A setting member is normally operatively disengaged from the impulse mechanism and is adapted to be movable into operative engagement with the mechanism and thereafter operated for adjustment of the mechanism.

1.119,782. December 1, 1914. TELEPHONE SUPPORT; C. J. Landin, Boston, Mass.; assigned to Universal Appliance Co. The support described in this invention is designed for holding desk stands in any convenient position for use. Two parallel connected links are both pivotally connected to a telephone supporting member. A pivotal sliding connection is provided between the lower end of each link and the supporting standard, one of the connections permitting the vertical sliding move-

ment and the other an in and out movement. Counterbalancing means act upon one of the links.

1,119,915. December 8, 1914. SERVICE METER CIRCUIT FOR TELEPHONE EXCHANGE SYSTEMS; S. B. Williams, Jr., Brooklyn, N. Y.; assigned to Western Electric Co. A pair of branch circuits extend to opposite poles of a source of current. There is a relay placed in each branch circuit and a pair of normally closed contacts provided for each relay to control the branch circuit from the other relay, one of the relays being actuated by the operation of a service meter to open the circuit of the other relay.

1,119,923. December 8, 1914. SELECTIVE SWITCHING APPARATUS; A. M. Bullard (deceased), by M. R. Bullard, administratrix, New York; assigned to Western Electric Co. A selector switch is adapted to make a plurality of selections under the control of a selecting relay associated with a connecting circuit. The selector switch is adapted to be maintained in selective positions between selections by a line relay.

1,120,049. December 8, 1914. TELEPHONE APPARATUS; O. M. Glunt, Rutherford, and E. C. G. Mueller, Elizabeth, N. J.; assigned to Western Electric Co. A hand telephone transmitter designed for use in limousines is described in this patent. It comprises a casing having a tubular handle secured thereto, a bridge piece mounted in the casing, a transmitter element and circuit controlling elements carried by the bridge piece. A switch operating member is mounted in the handle and cooperates with the circuit controlling elements.

1,120,605. December 8, 1914. TELEPHONE SYSTEM; W. W. Dean, Rochester, N. Y.; assigned to Garford Mfg. Co., Elyria, Ohio. A ringing key is connected with a strand of the cord circuit through normal contacts of a subscriber controlled supervisory relay so that the operator is unable to connect the ringing generator to a line already in talking communication.

1,120,606. December 8, 1914. PARTY LINE TELEPHONE SYSTEM; W. W. Dean, Rochester, N. Y.; assigned to Garford Mfg. Co., Elyria, Ohio. In this party line system a supervisory relay, having contacts in the circuit of a plurality of ringing keys, each having a number of contacts normally in series with a portion of the talking strand of the cord circuit, is actuated during conversation to disconnect the series key contacts from the talking circuit.

Legal Cases and Decisions

By A. H. McMillan

Tree Killed by Contact.

Action was brought against a telegraph and telephone company for injuries to a tree. The evidence showed that on the same side of the street were electric light poles and wires carrying a voltage of from 2,000 to 5,000 volts; that some years before the trial one of the defendant's wires was in contact with the tree and sparks were seen dropping from it; that the trouble was remedied, for a time, by putting on a glass insulator, but that after a while the sparking began again. The tree gradually died and a bare spot about ten inches around was found burned upon it, where the wire was in contact with it.

Under this evidence, it was held to be a question for the jury whether the tree was killed by contact with one of the company's wires. The jury found that it was. The court held that the company was liable and that the plaintiff was not bound to show where the electric current causing the injury came from or who was responsible for it. Rowe vs. Commercial Cable Co. (Mass.), 103 Northeastern, 479.

When Joint Use Contracts Should Be Written.

A parol contract between a telephone company and an electric light company for the use of the poles of either company by the other for its wires and appliances must be in writing where there is no intimation that the performance of the contract depends upon any contingency that could take place within a year. On the other hand a parol contract between such companies, which provides that the telephone company shall take down the poles of the light company on a street and put its own poles in their place; that the light company may use the poles for its wires and attachments and may also use any other poles of the telephone company, need not be in writing, where, within a year a telephone company erected the poles and the light company placed its wires and attachments thereon, since, though the contract was not to be performed within one year by both parties, it was fully performed by one of them within a year. So held the Court of Appeals of Kentucky in a suit brought by the East Tennessee Telephone Co. against the Paris Electric Co. for an injunction requiring the light company to remove its wires and other attachments from the poles of the telephone company upon all the streets of the city except Main street. The suit was dismissed by the court.

The contract in question fixed no time for its continuance and made no provision for the manner of its determination. It was held to be not of unlimited duration but might be terminated at the suit of either party on equitable terms. The contract in question between the companies was held not to be a license, revocable at pleasure, since neither company had any interest in the land on which the poles were erected or over which their wires ran; a license being defined to be the authority to do a particular act on the land of another without possessing any interest therein. East Tennessee Telephone Co. vs. Paris Electric Co., 162 Southwestern, 530.

Trimming Trees.

The statutes of Michigan provide that the use of streets and highways in the state shall not "injure any trees located along the line of such streets or highwavs." Under this statute it is held that a telephone company has no right to injure, cut down or destroy any shade tree planted upon the side of a highway, and if it does, it is liable in damages to the owner of the tree. Bolender vs. Southern Michigan Telephone Co., 148 Northwestern 697.

Broken Step Ladder.

In an action for injuries to an employe of a telephone company, caused by the alleged breaking of a step ladder, a finding that the company furnished him a defective ladder, based on conflicting evidence as to the condition of the ladder and the identity of a ladder produced on the trial, will not be reversed. East Tennessee Telephone Co. vs. Jeffries, 139 Southwestern, 825.

Condensed News Reports

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items of Interest as to Their Plants and Systems

Personal.

GEORGE A. HILLS, of Sioux City, Iowa, has been appointed manager of the New State Telephone Co., in Sioux Falls, S. D., succeeding George H. Dodds, resigned.

C. H. WEBB, for many years general manager of the Pike County Telephone Co., of Petersburg, Ind., has resigned and Fred E. Stewart has been appointed to fill the vacancy.

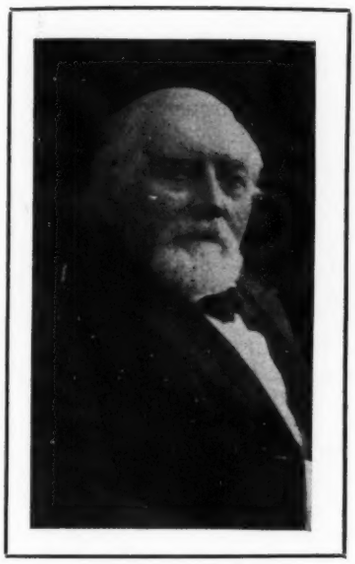
WALTER M. BOAZ, for the past ten years manager of the Johnson City, Tenn., exchange of the Bristol Telephone Co., has resigned on account of ill health. He will be succeeded by J. W. Turner, of Mississippi.

JAMES E. ALLISON, for some time chief engineer of the St. Louis Public Service Commission, has been appointed lecturer in economics in the Washington University. During the second semester of the current year, Mr. Allison will deliver a course of lectures under the general direction of the department of economics. The lectures will deal with the economic principles underlying the regulation of public utilities. Some

of the specific problems to be studied are the organization and operation of public utility corporations, their securities and the methods of financing them, and especially the method of valuing public utility properties for the purposes of taxation and rate regulation.

JULIUS ANDRAE, one of the early telephone manufacturers and president of the Julius Andrae & Sons Co., of Milwaukee, Wis., celebrated his 85th birthday anniversary December 2.

Mr. Andrae was born in Meissen, Saxony, Germany, and attended the city schools until he was 14 years of age, when he was apprenticed to a locksmith for four years, without pay. At the expiration of his apprenticeship his day's work began at 5 a. m. and ended at 7 p. m., for which he received the munificent sum of 50 cents per week. His wages were later raised to $1 per week, with board.



Julius Andrae.

Some time later Mr. Andrae went on a "wanderschaft," as it was called in Germany, and migrated to the city of Hamburg, where he worked at his trade as a locksmith. His next objective point was Goerlitz, Silesia, where he worked for a short time with a safe and vault firm, when he returned to his home city, Meissen. Here he found employment in factories and machine shops and working 12 hours a day, he received as much as $3 and $5 a week—a substantial sum.

In Meissen Mr. Andrae won the distinction of having helped in the construction of the glass covered roof over the Bairischer bahnhof (Bavarian depot) together with two bridges in conjunction with the depot. Mr. Andrae acted as foreman on this job and received $1 per day.

In 1855 Mr. Andrae came to Milwaukee and secured employment with the firm of Schumacher & Johnson, earning $1.25 per day. It was while he was with this firm that Mr. Andrae built his first safe. About four years later, he purchased a little shop of his own, which marked the beginning of his present business. It was but a short while after that the Civil War broke out. This brought an avalanche of work to "the little shop around the corner," as practically all of the tool boxes used in service were bound with iron and equipped with hinges and locks.

After the war, Mr. Andrae purchased the lot adjoining his shop and in 1866 erected a more commodious building to handle his rapidly growing business. From time to time this was added to until the firm moved to Sycamore street, where it met with its first serious drawback by a fire on January 7, 1911. However, Mr. Andrae was soon ready for business again in his present location at Broadway and Michigan street, with the addition to his force of his two sons. Although retired from active business, Mr. Andrae is still very much interested in the business and visits the office and shop several times a week.

Obituary.

GENERAL THOMAS SHERWIN, for 25 years president of the New England Telephone & Telegraph Co., died at his home in Boston, Mass., on December 19, at the age of 75. General Sherwin was one of the most prominent figures in Eastern telephone circles and at the time of his death was chairman of the board of directors of the New England company besides being a director in many other organizations.

He was born in Boston, fitted for college at the Dedham High and Boston Latin schools, and was graduated from Harvard in 1860. At the outbreak of the civil war, he was a master in the Houghton School at Bolton. He was elected captain of a company of young men who enlisted from Bolton and neighboring towns, later being commissioned first lieutenant and adjutant of the 22nd Massachusetts infantry, becoming successively major, lieutenant colonel and colonel and taking part in most of the battles fought by the army of the Potomac until the expiration of his term of service in 1864. He was brevetted brigadier general of United States Volunteers "for gallant and meritorious services during the war."

Upon his return from the field of hostilities, General Sherwin resumed teaching, and for a year was an instructor at the English High School of Boston, of which his father, Thomas Sherwin, had long been the distinguished principal. In 1866 he was appointed deputy surveyor of customs, and in 1875 was elected to the office of collector of the city of Boston.

General Sherwin become interested in telephony in its earliest days and in 1883 became auditor of what is now the American Telephone & Telegraph Co. In 1885 he was made president of the New England branch of the organization. As auditor of the Bell companies, in an effort to reduce somewhat the crude system of accounting that prevailed along the newly consolidated lines to a uniform standard to meet the requirements of all branches, General Sherwin learned many things that were later of great value to him in his work for the New England company. Those early years were crowded with many trying responsibilities for all who were associated in the management of the Bell companies, and General Sherwin followed the progress of the industry with painstaking care, becoming one of the leading authorities of the country in his chosen field. Though a man of great wealth, he always objected strenuously to being classed as a "captain of industry," and declared himself merely "a worker in the field of telephony." In his quarter-century's administration, the New England company developed from small beginnings into the great organization of today.

General Sherwin's death was announced in a telegram from President Spalding, of the New England company to President Theodore N. Vail of the American Telephone & Telegraph Co. and to the presidents of the various associated Bell companies in the United States and Canada, which included the following tribute:

"A brave and brilliant soldier during the civil war; a pioneer in the telephone field—for 23 years auditor of the American Bell Telephone Co., and for 25 years president of the New England Telephone & Telegraph Co.; a man of the highest character and ability and with a charming personality. His death is a great loss not only to the community, but also to the telephone interests over the whole country."

New Companies and Incorporations.

BUCKHORN, KY.—A local telephone company has recently been organized by Levi Williams, James Wheatly and others. Lines are to be constructed to Jackson and Hazard.

PINE MT., KY.—A telephone company has been organized by B. W. Smith and others. The company has a capital stock of $1.000 and will build a system into Jane, having connections at Harlan.

Election.

BIRMINGHAM, IOWA.—The Farmers' Mutual Telephone Co. held its annual meeting recently and elected the following officers for the ensuing year: President, M. G. Johnston; vice-president, J. Roth; secretary, Warren Brown; treasurer, J. W. Young; directors, G. Baldwin, R. Woodrow and G. W. Morrell.

SPRINGDALE, IOWA.—The Highland Telephone Co. elected the following officers for the coming year at a recent meeting: President, A. Pearson; vice-president, W. R. Branson; secretary, H. Jones; treasurer, J. E. Mather.

READING, MICH.—The Reading Telephone Co. has held its annual meeting recently. The officers elected are as follows: F. Holdridge, president; B. Ables, secretary and treasurer; W. Phelps, H. Terpening, H. Bradley, C. Grover and F. Johnson, directors.

PENN YAN, N. Y.—The Crosby & Barrington Telephone Co. has elected the following officers for the ensuing year: H. S. Fullagan, president; F. Crosby, vice-president; H. C. Overshire, secretary and treasurer; S. I. Thayer, manager.

Financial.

SHELDON, MO.—The Farmers' Mutual Telephone Co. has filed an amendment to its articles of incorporation showing an increase of its capital stock from $3,000 to $4,000.

DEMOCRAT, KY.—The Rockhouse Telephone Co. has increased its capital stock from $2,000 to $3,000 and will construct new lines from Colson to Emmaline.

PIKESVILLE, KY.—The Citizens Telephone Co. has increased its capital stock from $5,000 to $6,000.

Miscellaneous.

HAZARD, KY.—The Cumberland Telephone & Telegraph Co. will construct lines from Hazard to McRoberts and Jenkins, via Cornettsville, Blackey and Whitesburg.

OLIVER SPRINGS, TENN.—The Oliver Springs Telephone Co. is contemplating building a new exchange.

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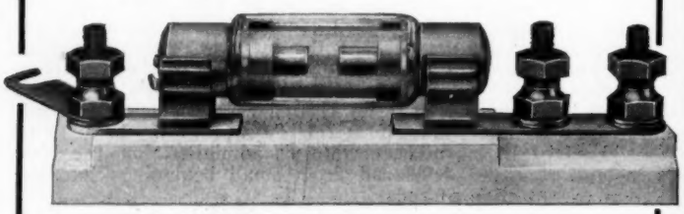

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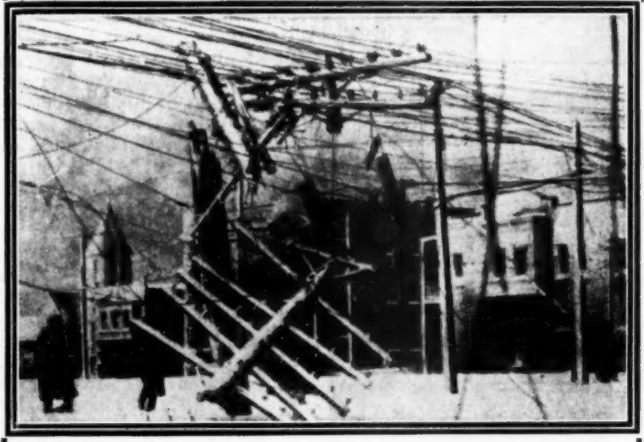

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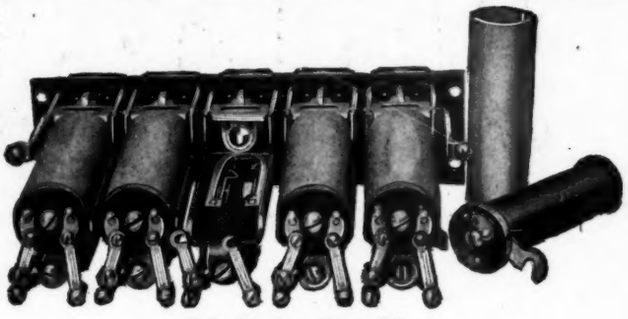

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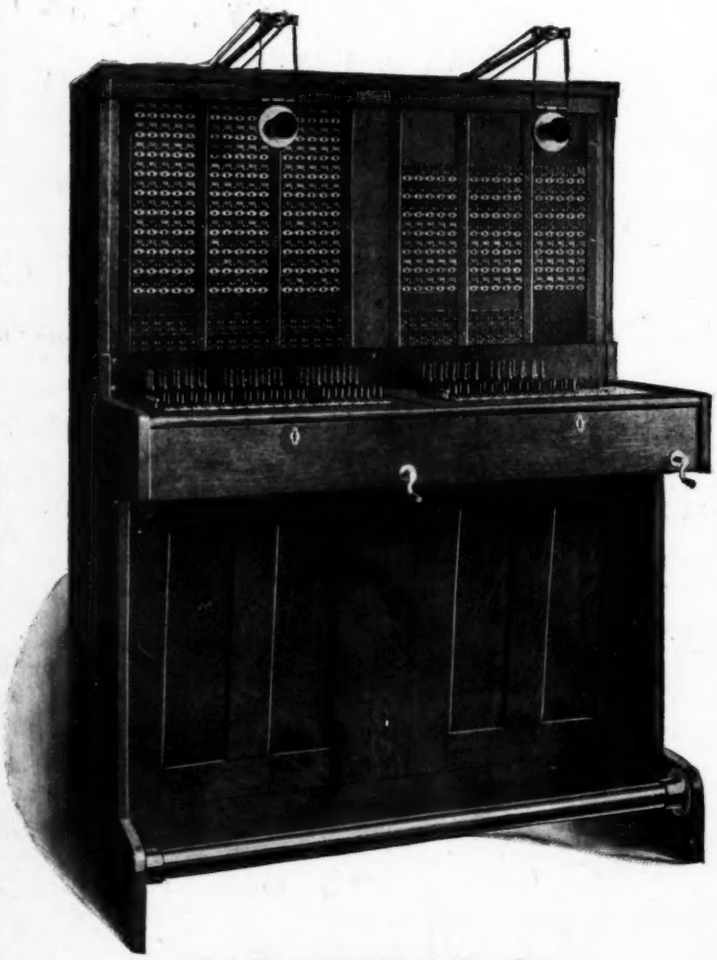

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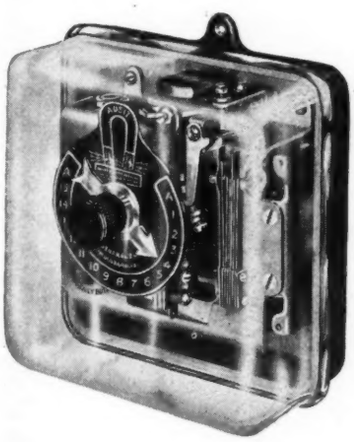


The Adsit Attachment (about one-half actual size)

This attachment gives to subscribers on a party or rural line the same private service rendered to subscribers in business districts of large cities. In fact, it is a perfect Lock-out, as the two parties talking have exclusive use of the line—thus giving one hundred per cent. talking efficiency.

EFFICIENCY—The talking efficiency of the circuit is the same as that on a circuit on which the Lock-out is not installed, as you do not talk through any coils of any kind, nor past any ringers. As no ringers are on the line while talking (the selecting magnets, of the same resistance taking their place), the talking circuit is *identical* with the circuit in the *present* line.

In fact, the efficiency of the line is greatly enhanced for the reason that the two parties talking have the *full benefit* of the talking circuit, and the line is not impaired in any way by other parties breaking in on the line and reducing the current, and otherwise disturbing, disrupting or reducing talking conditions.

CONTACTS—Although there are several contacts in the Adsit attachment, only two are used in the talking circuit, these being of pure platinum points mounted on strong springs which insures perfect connections at all times. The instrument is absolutely dust-proof.

THE INTERCOMMUNICATING FEATURE—The attachment converts any line on which it is placed into an intercommunicating system, permitting any parties on the line calling each other *direct* without going through central, thereby giving day and night line service irrespective of whether the central office is kept open or not. The operation by which any subscriber can select any other subscriber on that line, including the calling of central, requires only three or four seconds' time—shorter than all code rings—much less time than it takes to secure central on a city line, and actually less time than it takes to put a call through on the big, modern automatic central systems.

In fact, a call can be put through with the assistance of the Adsit attachment in a shorter space of time than any other method known to the telephone world.

It saves transmitter batteries, as other subscribers cannot "listen in." Therefore, no transmitter battery is used up except during the act of conversation.

ADJUSTABLE AND INTERCHANGEABLE—The attachment is adjusted to any phone, in any position on the line, and is interchangeable in itself, and all of its parts are interchangeable.

SELECTIVE RINGING—The ringing is selective. In making a call, no other bell except that of the party wanted, is rung. No other bells on the line are operated.

NO "RING-OFF"—The use of the Adsit attachment makes it unnecessary to "ring off." The line is restored automatically to normal conditions instantly when the receivers are hung up at the conclusion of the conversation, or by the operation of the automatic timer at central.

With the Adsit attachment the line cannot be monopolized, as at present, as an automatic timer at central restores the line to normal at the end of any time period desired by the telephone company.

BUSY SIGNAL—A visual busy signal on each instrument shows the subscriber at all times whether or not the line is busy.

NO GROUNDS WHILE TALKING—In the Adsit attachment the selecting, talking and releasing are all metallic, the ground being used only for ringing purposes, and this ground is taken off the moment the receiver is lifted from the hook, thereby insuring a total absence from grounds while talking.

To distinguish this attachment from any other system or device offered as a Lock-out, the full descriptive definition is given as follows:

The "Adsit" is a—

"Selective Calling, Selective Ringing, Intercommunicating, Automatic Time-controlled, Adjustable, Interchangeable, Automatically Restored, Lock-out Attachment."

NOTE: Chapter 2, entitled "How It Does It", giving further information about the new Lock-out, will be printed in next week's issue.

During the Holidays

There is a natural cessation of business, folks are given to the holiday spirit and for a time forget business cares.

The Garford Manufacturing Co.

Wishes for all of you a merry and enjoyable Christmas and a most happy and prosperous New Year.

1914 has been good to us and we hope likewise good to you, but old Father Time will soon usher in the new year and there never was a brighter outlook for Independent Telephony. The prospects for a big business were never greater.

To our many friends and customers—to all of you—Good Luck.

The Garford Mfg. Co.—Elyria, Ohio

Branch:
Garford Mfg. Co.
Kansas City, Mo.

Distributors:
Dean Electric Co., Seattle, Wash.
Dean Electric Co., Los Angeles, Cal.
Sumter Tel. Supply Co., Sumter, S. C.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

The Quality of Garford Equipment

has been gained and is steadily maintained by strict adherence to a determination to deliver to you the greatest possible value in telephone apparatus.

Ceaseless care and attention to manufacturing, closest scrutiny in selections of materials and a fixed and determined policy of "Do it Right" is responsible for the steadily increasing demand for "Garford Goods."

Your service problems, large or small, can and will be handled promptly, correctly and economically by Garford engineers, and you are invited to consult with us as to plans best suited to accomplish what you wish to accomplish.

Our services are at your command and surely you can not be indifferent to equipment or service offered you by the Leading Independent Manufacturing Company. Get in touch with us now.

The Garford Mfg. Co.—Elyria, Ohio

Branch:
Garford Mfg. Co.
Kansas City, Mo.

Distributors:
Dean Electric Co., Los Angeles, Cal.
Dean Electric Co., Seattle, Wash.
Sumter Tel. Supply Co., Sumter, S. C.

The Message of the Desk

Yesterday, Today and Tomorrow—Serving You

For fourteen years this desk has been sending messages for others.

It has been helping the wire chief keep a great bundle of nerves—the wire plant in order. It has been guarding, perhaps, your own line.

Important work this—often times the very salvation of the exchange depending upon what this apparently simple apparatus can do for the quiet, business like man sitting before it.

But what is the story that this desk tells?

"Fourteen years in service and doing good work."

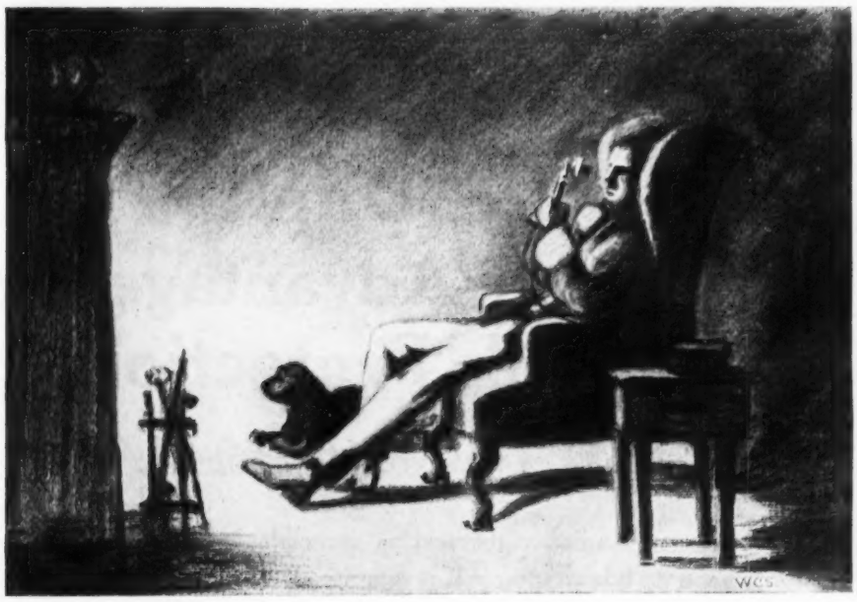
That is its message and it is the economy of exchange management.

The name plate?

KELLOGG

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

A Good New Year to You



As We Journey Through Life Let Us Live By The Way.
(Moore)

On a winter night as we sit by the fire talking with some congenial soul---over a Kellogg desk stand---*we live by the way.*

Rough weather and life's troubles fade and the magic of the yule log is a pleasant background for our thoughts. In the coming year may you and your subscribers have bounteous opportunity to live by the way.

We will furnish the telephone way, and it's the wide, clear, far-reaching highway of the best independent telephone service.

KELLOGG

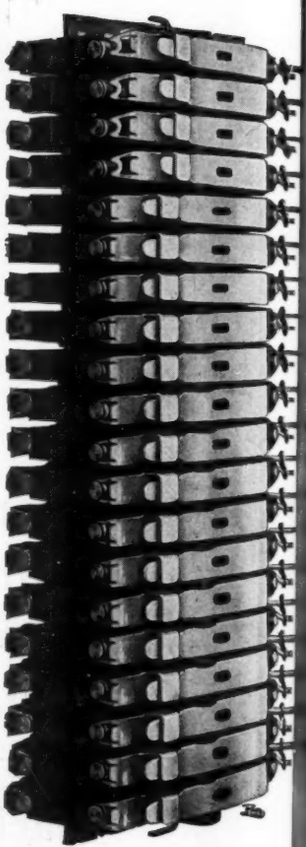
Please tell the Advertiser you saw his Advertisement in TELEPHONY.

COOK

TERMINALS PROTECTORS

Why Don't You Take Advantage of Cook Protection?

The No. 10 Protector



Radically different in principle and design from other types. It is superior in all respects, not only in theory, but proven by actual experience. Ask your engineer the advantages of the following:

The heat coil is NOT made of wire; it cannot burn out or short circuit. Metal shell will not burn up and start fire in the coils above. No defective coils or loose contacts in circuit. Springs of each pair are insulated from adjacent springs.

No bolt connections are used to transpose line and switchboard terminal, consequently no loose connections in circuit. A re-soldering—not a self-soldering protector—the advantage is that every time protective apparatus is re-set a test is made for defects in coil.

Why not investigate Cook's No. 10 — the protector that experience will teach all to swear by.

Frank B Cook Co.

326 W. Madison St., Chicago, Ill.

Western Representative:
Manny-Meyers Co.
Seattle, Wash.

Southwestern Representative:
Tel-Electric Co.,
Houston, Texas

CHICAGO

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

ERICSSON STEEL TELEPHONES

Five Reasons Why You Should Use Them

1st— They are the handsomest telephones made, and subscribers are pleased with them and take pride in keeping them neat. They put a stop to chronic kickers.

2nd— They are built to last almost indefinitely. The black enamel finish will outlast any known wood polish and will match any color of woodwork or inside finish.

3rd— They cost no more than reliable telephones of other makes, and are worth considerably more to you. They do not deteriorate and they save you the heavy maintenance expense you have been accustomed to with others.

4th— They are made by a manufacturer with a reputation for making the best telephone apparatus known. Their guarantee makes you safe.

5th— You will be using Steel Telephones altogether some day, so why not begin now? The sooner you get acquainted with the Ericsson kind the better pleased you will be later.

BRANCHES AT

Atlanta, Ga., 83 Marietta St.
Birmingham, Ala.
Boston, Mass., 451 Atlantic Avenue.
Butte, Mont., 53 East Broadway.
Cedar Rapids, Iowa, 315 So. Second St.
Chicago, Ill., 14 N. Franklin St.
Cleveland, O., 124 St. Clair Ave., N. E.
Edmonton, Alta, Can., 504 Agency Bldg.
Havana, Cuba, P. O. Box 6.
Indianapolis, Ind., 124 So. Meridian St.
Jacksonville, Fla., 24 W. Forsythe St.
Lincoln, Neb., 136 So. 10th St.
Los Angeles, Cal., 1233 So. Olive St.
Louisville, Ky., 514 W. Main St.
Minneapolis, Minn., 19 N. 6th St.
New Orleans, La., 810 Canal St.
Pittsburgh, Pa., 31 Terminal Bldg.
Portland, Ore., 329 Ankeny Ave.
Richmond, Va., 5 Governor St.
San Francisco, Cal., 530 Golden Gate Ave.
Spokane, Wash., Paulsen Bldg.
Toronto, Canada, 36 Adelaide St.

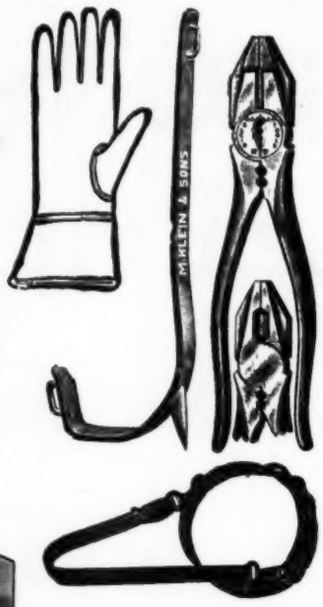
ERICSSON MFG. COMPANY

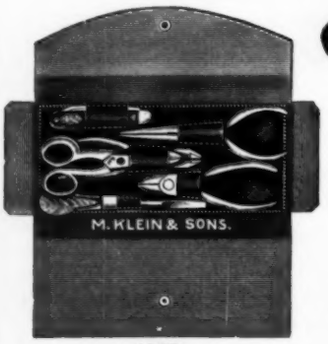
1102 MILITARY ROAD :: :: BUFFALO, N. Y.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

Purchase
KLEIN TOOLS
and Effect
Real Economy

They are good tools and they give long service.





403K

Write for our illustrated Catalog—mailed on request without obligation

Mathias Klein & Sons
Canal Station 34. Chicago

Switchboard Bargains

No. 1 Western Electric Co.'s
1680 Answering Lines
2600 Multiple in five sections

Condition as good as NEW

Two-position Wire Chief's Desk
Two-position Chief Operator's Desk

Hayes Arresters and Main Frame

For sale at one-half original cost

Geo. A. Welch, Receiver,
1029 Garfield Bldg. Cleveland, O.

A big manager said to our Mr. M.

"I do not want a man around me—long—who doesn't think enough of the telephone business to read its current literature."

"For that kind of man is never awake to his opportunities—fails to realize that one must be modern to get the best jobs these days."

"And the fellow I like most on my staff is the one that is trying to get my own job—some time."

"Mind what I say: the man who thoroughly and regularly reads his telephone paper is, every so often, as sure as fate, going to find an article, or an item, or a paragraph, that will do him more real good—and also his company, usually—than the paper will cost him for many a year. I know."

And this manager himself has read TELEPHONY practically ever since the first number. He doesn't mention it, but he means it.

If you want to try a subscription for yourself, send us a dollar, and we will mail you the magazine for 20 weeks, and also send you at once a copy of the Dollar Book, 196 pages, 80 illustrations—"The Inspector and the Troubleman." Don't cut this out—merely refer to it.

TELEPHONY PUBLISHING COMPANY, Monadnock Block, CHICAGO

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

CRAWFORD CEDAR CO.
MENOMINEE, MICH.
We are producers of Western Red Cedar and Northern White Cedar **POLES.** Prompt shipments guaranteed.

Duluth Log Company
POLE SERVICE
Duluth, Minnesota

POLES
THE MAC GILLIS & GIBBS CO.
MILWAUKEE, WIS.
"Immediate Shipments Guaranteed"

We Want Your Pole Orders
QUALITY? Idaho, Michigan and Canadian Cedar. The Best that grow.
PRICES? Remarkably reasonable!
SERVICE? Immediate shipments—any quantity! Poles in *stock.*
No matter where you are, our yard locations and shipping facilities make it possible to reach you in a hurry.
THE F. BISSELL COMPANY, Toledo, Ohio

Idaho Cedar Poles
Northern Mercantile Co. Ltd.
Resident Producers
Sand Point, Idaho

WESTERN CEDAR POLES

AN EXCELLENT ASSORTMENT AT GOOD PRICES
DENNIS BURK & COMPANY CABINET, IDAHO.

POLES OF STERLING QUALITY
Oldest Cedar Pole Firm in Business — Producers for 34 years
MICHIGAN AND WESTERN CEDAR
W. C. STERLING & SON COMPANY
1880 MONROE, MICHIGAN 1914

It costs you more to do without
RED DEVIL "BONDED" LINEMEN'S TOOLS
than the tools themselves. Why continue this extravagance? Investigate.
SMITH & HEMENWAY CO., 140 Chambers St., New York, N. Y.

Finest Quality
Quickest Delivery
Yards from Maine to Washington
The Largest Pole Producers in the World
POLES
Wire or Write for Delivered Prices
National Pole Company
ESCANABA :::: MICHIGAN

CEDAR POLES Write for Prices. Prompt Shipments from Wisconsin or Chicago Switching District Yard on I. H. Belt R. R.
TORREY CEDAR CO., Clintonville, Wis.

"INSULATE"
Telephone Receiver Shells, Mouth-Pieces Handles and Electrical Insulations of all shapes and sizes

GENERAL INSULATE COMPANY
1007 to 1015 ATLANTIC AVE., BROOKLYN, N. Y.

From **POLE** to **POLE**
you will find none better than the
IDAHO CEDAR POLES
We produce in our own Forests.
Sound in Quality. Right in Price.
Large Stocks. Quick Service.
Sandpoint Lumber and Pole Co.
Sandpoint, Idaho

ELAPSED TIME

is what a Telephone Company sells to the consumer of its Toll Service. It is as much a commodity as sugar, flour, or tea sold by a grocer.

In fairness to both company and public this service should be accurately measured. The toll operator's estimate or guess as to the time consumed in a toll conversation may mean a loss to either party—it is generally a loss to the company.

It is so much easier to mark down the minimum charge and have no question raised, than to try to collect for "excess time" when one is not sure.

The CALCULAGRAPH

Is the scale which accurately weighs toll service. It records **Elapsed Time**—the number of minutes and fractions of a minute a toll circuit is in use. It is fair to both company and the purchaser of its service. It furnishes indisputable data for collecting pay for all "excess minutes."

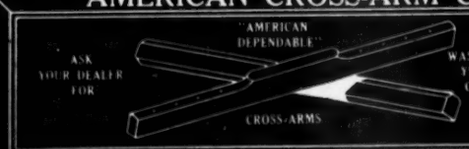
The use of The Calculagraph will also save time of the operator and improve the quality of service.

The Calculagraph has been the standard instrument for timing toll messages in every country in the world where there are telephones, for 15 years.

Calculagraph Company

1416 Jewelers Building **New York City**

AMERICAN CROSS-ARM CO.



CHICAGO

You Can Buy Burnley Soldering Paste

In Any Size You Want

It is made in 2 oz. boxes to 50 lb. cans

May we send samples?

Burnley Battery & Mfg. Co. **North East, Pa.**

The Portable WESTON

Miniature Precision Instructions

are especially adaptable for use in telephone inspection service. They are provided with a neat leather carrying case and shoulder strap, or they may be slipped into the coat pocket.

These instruments possess all the excellent characteristics which have made Weston Standards world-famous. They are accurate, dead-beat, extremely sensitive and shielded against external electrical and magnetic influences.

Bulletin No. 8, giving full description of these and also the Weston Miniature Precision Switchboard Instruments and Portable Battery Testers, will be sent on request.

WESTON ELECTRICAL INSTRUMENT CO., NEWARK, N. J.

New York	Boston	San Francisco	Atlanta	Berlin
Chicago	St. Louis	Detroit	Richmond	and
Philadelphia	Denver	Cleveland	Toronto	London

OKONITE

TRADE MARK Registered U. S. Pat. Office

INSULATED WIRES & CABLES

The STANDARD *for* RUBBER INSULATION

The widespread use of a certain make of insulated wire confers upon that particular make a significant degree of distinction. OKONITE bears this distinction because of the quality of its insulation.

Install Okonite Lead-Covered or Steel-Taped Underground Cables. They are permanently reliable.

THE OKONITE COMPANY

253 Broadway
NEW YORK

Cut Out Drop Wire Repair Expense

Faulty drop wires are a source of expense and annoyance. Continued trouble lessens the efficiency, reputation and profits of your company.

You can solve the whole drop wire problem at one stroke by changing to

IRONITE

The Ideal Duplex Drop Wire

Much cheaper than copper wire. Not affected by the extremes of heat or cold. Absolutely weather-proof. Will not sag or stretch, nor break under any ordinary service strains.

Flexible and easy to handle. Stops all expense for drop wire repairs. If your jobber hasn't the genuine send your order to us and we will make immediate shipment from stock.

If you test, you'll buy it. Send for big free sample and prices.

Paragon Electric Co.

Madison Terminal Bldg., Chicago, Ill.

610 First Ave., Seattle.
212 W. Third St., Los Angeles.
440 Market St., San Francisco.
Central Electric Supply Co., Limited, Toronto, Agents for Ontario.
Houston & Co., Ltd., Winnipeg, Agents for Manitoba.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

"Opportunities"

Copy for classified advertising for the current issue should reach us not later than Thursday morning when forms close. Rates for classified advertising will be sent upon request.

"Rebuilt" Telephone Apparatus

and exchange equipment saves you 30 to 50 per cent without sacrificing quality or efficiency.

Switchboards

—Telephones—Apparatus—Protection Equipment—Cable—Everything you need for the installation and operation of a complete exchange—Magneto or Central Energy—of the best and most reputable manufacturers.

Seven Years Successful Operation

of our "Rebuilt" Equipment Department puts it past the experimental stage. Quality and price will make you a permanent customer. Better investigate.

Ask for Our Free No. 78 Bargain Bulletin, Address

"Rebuilt" Equipment Department

PREMIER ELECTRIC COMPANY Chicago, Ill.

"REBUILT" when connected with PREMIER means something

Cable Testers

A CABLE TESTER to be a success must work thru high resistance Moisture faults as well as dead shorts, crosses or grounds. Get a Wireless Cable Tester on trial and compare it with any other. Electric Specialty Mfg. Co., Cedar Rapids, Iowa.

Cross Arms, Pins and Brackets

TELEPHONE COMPANIES—We make yellow pine cross arms, pins, steps and brackets. Prices and quality right. Prompt shipment. Write us. Central Lumber Co., Chattanooga, Tenn.

Directory Hangers

WE BEG TO DIRECT YOUR ATTENTION to the Universal Wire Loop, an improvement upon the ordinary string loop for hanging up catalogues, directories, telephone books, prices current, etc. Write us for prices and samples. Wire Loop Mfg. Co., 75 Shelby St., Detroit, Mich.

Equipment For Sale

HIGH GRADE EQUIPMENT IN EXCELLENT CONDITION FOR SALE CHEAP—Some of the equipment is almost new, was discontinued when Bell and Independent companies consolidated.

COMMON BATTERY switchboards. A brand new 100 line board; a slightly used 500 line board, an 800, 1,200 and 2,500 line multiple board. All boards equipped for harmonic four party lines, complete with toll board, chief operator and wire chief's desks, power board, batteries, etc. Also KELLOGG, DEAN and STROMBERG desk and wall telephones with and without party line ringers; also Cook protectors for use at both central office and subscriber's telephone, also pay stations and P. B. X. boards.

MAGNETO EQUIPMENT. We have an almost new 400 line Kellogg board with transfers, self-restoring drops, 4 party line keys on each cord circuit, good as new at bargain price; also magneto harmonic party line telephones and harmonic convertor for ringing same. We also have 50 line and 100 line magneto boards and magneto telephones at bargain prices.

MANAGER MAGNETO PLANT, we will sell you a complete common battery switchboard and telephones equipped for party line selective signaling, for less than half what you would pay for new magneto switchboard and telephones. This common battery equipment will greatly reduce your operating and maintenance expense, and give far better service. We will guarantee satisfaction.

AUTOMATIC SWITCHBOARD, complete for individual and party lines and toll board, wire chief and information or chief operator's desks, wall and desk telephones with harmonic ringers. This equipment is one of the Automatic Electric Company's latest type, in excellent condition. Was only slightly used before consolidation. Will sell for less than price of common battery and guarantee equipment O. K. Can furnish from 1,000 to 5,000 lines. This is an unusual opportunity to get an automatic plant at low cost.

TELEPHONE EXCHANGE EQUIPMENT CO.,
1657 Monadnock Bldg., Chicago, Ill.

Equipment Wanted

WANTED TO BUY a medium sized telephone plant located in the state of Washington, Oregon or Idaho. State full particulars in first letter. Address 1970, care TELEPHONY.

Financial

Financial assistance furnished to any well rated telephone company or Mutual Farm line company at low interest rate for farm line or magneto exchange extensions. State fully just what you need in the way of equipment and supplies, and terms desired. Address Interstate Electric & Mfg. Co., Sioux City, Iowa.

Persons wanting financial assistance in establishing, equipping, rebuilding or extending incorporated rural telephone lines or Mutual Farm lines will be accommodated at reasonable rates. Address, 1948, care TELEPHONY.

Poles

POLES ALL SIZES—Direct from the stump. Prompt and satisfactory service. We are Producers. Get our prices. KAYE & CARTER LUMBER CO., Minneapolis, Minn.

Positions Wanted

POSITION WANTED—Young man, single, good education, doesn't drink; two years' experience installing, trouble, storeroom and repair, good motorcyclist. Will go any where. Address 1959, care TELEPHONY.

WANTED—Position as wire chief manager or assistant to telephone exchange. Thoroughly experienced in magneto or common battery from ground up. Address J. E. Thurston, North Vernon, Indiana.

Ribbons for Calculagraph

A 50 PER CENT. SAVING interests you. Our price, 25c each —$2.50 per dozen. Customers say, "Best ribbons they have ever used." Horney & Wright, La Fayette, Ind.

Telephone Plant Construction

WHEN YOU BUILD A NEW EXCHANGE or rebuild your old one, you will save money by consulting with us. Correspondence solicited. Home Electric Construction Co., Macomb, Ill.

Telephone Supplies

WE ARE JOBBERS. Get our prices on telephones, wires, pins, brackets, poles, cross arms, glass insulators—pole line hardware. Indianapolis Elec. Supply Co., Indianapolis, Ind.

CONSTRUCTION SUPPPLIES—Anything you need for your construction work can be ordered from us at prices that can't be beat. Doubleday-Hill Elec. Co., 721 Liberty Ave., Pittsburgh, Pa. Southern Warehouse, 727 12th St., N. W., Washington, D. C.

Test Connectors

WHY NOT GET THE BEST, as long as it costs no more? N. C. Test Connectors have exclusive advantages. Write if interested. Schutz Mfg. Co., 3225 Ravenswood Ave., Chicago.

Timing Devices

ACCURATE TOLL CALL RECORDS are of prime importance. Monarch Time Stamps provide records that cannot be questioned. Write for information. Walker Bros. & Haviland, Chicago, Philadelphia, New York.

Aerial Cable Rings
C3, D9, E20, N9, S25.

Anchors, Guy
C47, E20, F3, G8, J5, M12, W20.

Appraisers
G6, J2, L9, M2, P8.

Arms and Brackets (for holding telephones)
A13, C38, S38.

Arms, Cross
A10, B10, K6, S18, W20.

Arresters, Lightning (See Protective Devices)

Asbestos
J5.

Attorneys, Patent
C30, D15, M2.

Auditing, Accounting
C32, G6, P8.

Automatic Telephones
A22.

Bars, Tamping and Digging
H8, K8, L4.

Batteries, Dry
A13, F14, J5, M5, N17.

Batteries, Primary
E3.

Bells, Magneto
A13, S6.

Blank Books, etc.
T3.

Bolts and Nuts
D9, H8, L4, R7.

Bolts (Expansion)
C20, D9, H8, L4, S25.

Bolts (Toggle)
D9, H8, L4, S25, W12.

Books
D10, S22.

Booths, Telephone
B19, F16, Y2.

Boxes, Battery
E17, P7.

Cable
A15, A16, A25, I5, R9, S12, S23.

Cable Cars
B10, H1.

Cable, Clips (See Clips, Cable)

Cable Hangers (See Hangers, Cable)

Cable, Rollers
B10, H1, M12.

Cable Splicing Joints
M12.

Cable Terminal
C38, H1, R4.

Carbon
F14, M5, N17.

Clamps, Ground (Plates, Cones)
B15, C3, N2, P7, S25.

Clamps, Guy
C38, C47, E20, H8, L4, M12, N9, R4.

Clamps, Lamp
M32.

Climbers
C27, K8, S15.

Clips, Cable
A25, C38, M12.

Clips, Testing
F11.

Clocks
R17, S38, W1.

Composition, Insulation
E11, G2, S9.

Concrete Mixers
S14.

Condensers
A13, A25, E6, M7.

Conduit, Underground
B17, C7, F8, J5, M4, W20.

Connectors, Test
C38, R4, S4.

Connectors, Wire
C38, N9, R4.

Construction Specialties
B10, C3, C38, E17, H8, K8, M12, R4, S15.

Cord Adjusters
M12.

Cordage, Telephone
A25, B4, M28, R17, S35.

Counters
V4.

Creosoting
W20.

Distributing Racks
C38, R4.

Electrical Instruments
F10, L7, M12, P13, W10.

Engineers, Telephone
C30, D15, G6, J2, L9, M2.

Fans, Booth
H1.

Fibre
C35.

Fire Alarm Systems
F10.

Flux, Soldering
A25, B4, B7, B13, B15, B22, D18, H6.

Fuses, Mica
C38, H1, R4.

Generators, Ringing
W2.

Gloves
M31.

Grounding Device
B15, C3, P7.

Guy Anchors (See Anchors)

Guy Clamps (See Clamps, Guy)

Hangers, Cable
B10, C3, C38, E10, E17, E20, H1, M12, N9, R4.

Improved Party Line Systems
D4.

Instruments, Cable (Fault Finding)
E9, M12, S32.

Insulators
E17, H3, I3, P7, U2.

Intercommunicating Systems
A25, K5, S35.

Iron, Norway
N1.

Joints, Cable Splicing (See Cable Splicing Joints)

Motor Trucks
R6.

Office Fixtures
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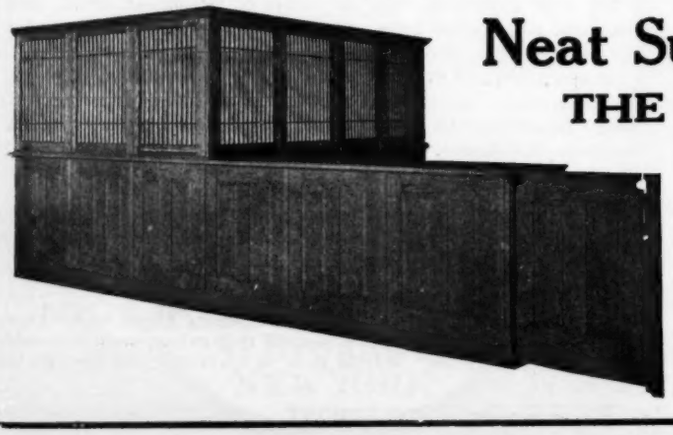

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You can make a "test" in one-tenth of the time required to skin a wire for one, and neither does the wire or insulation suffer any damage.

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Western Electric Company No. 22-A, 3-bar bridging hand generators at	1.00
Baird 3, 4 or 5-bar compact type cabinets, new at	.65
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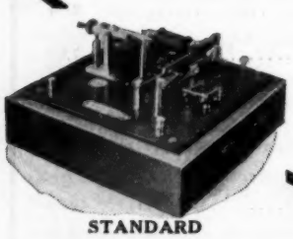
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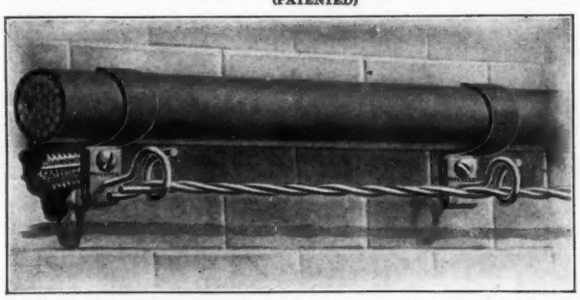

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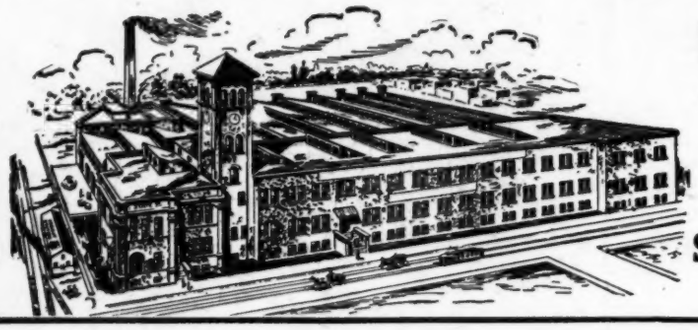

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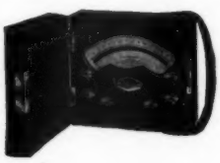

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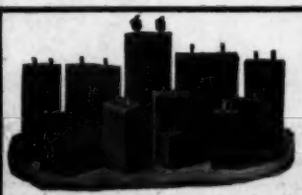

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